



Appendix F. Project Evaluation Process

MoveAZ Plan

prepared for

Arizona Department of Transportation

prepared by

Cambridge Systematics, Inc.

In association with

Lima & Associates

August 2004



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1.0 Introduction

1.0 Introduction

This technical memorandum describes the process used to evaluate major transportation projects in support the Arizona Long-Range Transportation Plan (MoveAZ plan). This technical memorandum is the third in a series of report that describe the technical evaluations conducted as part of the MoveAZ plan. The *Task 10, Performance Measures Technical Memorandum* describes the performance measures that are the basis for the analysis described here. The *Task 9, Demand and System Performance Technical Memorandum* provides estimates of system use for all transportation modes and an evaluation of current and future performance for the entire State and each of the State's engineering districts.

The following sections are presented in this memorandum:

1. **Funding** – An overview of the institutional environment that determines the funding available for major projects;
2. **Data** – A review of the data sources used to support the evaluation process;
3. **Project Evaluation Process** – A description of the application of performance measures used to evaluate projects and system performance; and
4. **Weights** – A description of the system of weights used by MoveAZ.

2.0 Funding

2.0 Funding

The MoveAZ performance evaluation process began with an examination of the total funding available to construct major projects on the state transportation system. Identifying available funding sets the ultimate constraint on the transportation projects identified by the MoveAZ plan. This section describes the process used to estimate funding available for major projects over the course of the plan from 2010 through 2025. The evaluation process will be implemented to represent the 2010 transportation system, because the Arizona Department of Transportation (ADOT) has made commitments to specific projects through 2009 as part of its *Five-Year Transportation Facilities Construction Program* (referred to as the five-year program).

The five-year program is a list of transportation projects for which ADOT has identified funding. This program is generated through the coordinated efforts of several ADOT divisions and adopted by the Arizona Transportation Board each year. The program will begin to include MoveAZ plan generated projects and analysis in the 2006 to 2010 program cycle.

The process for estimating the available funding for projects involved the following steps:

- **Funding scenarios** – Estimation of three funding scenarios used to guide the MoveAZ plan;
- **Funding regions** – Funding is divided among three major regions of the State, in accordance with existing ADOT policy; and
- **Sub-program and project funding** – Funding levels are estimated for sub-programs and major projects in the three major regions of the State, in accordance with existing ADOT programming practice.

■ 2.1 Funding Scenarios

The MoveAZ plan used three investment scenarios based upon estimates of state and Federal funds available to Arizona, as estimated by ADOT's financial section. The three scenarios were:

1. **Constrained** – A projection of currently available funding sources through 2025.
2. **Reasonably increased revenues** – An increase above the constrained scenario based on a reasonable increase in revenues that could be derived from Federal and/or state

sources. This incremental revenue could come from a Federal or statewide motor fuel tax, other user fees, increased Federal spending from the pending transportation reauthorization legislation, or other sources.

3. **Unconstrained** – No financial constraints, including all projects that address specific needs on the state highway transportation system, as identified in previous planning processes.

The constrained scenario represents funding that will likely be available to the State for future programming by 2025. The reasonably increased revenues scenario provides a means to describe the additional performance gains that could be derived from a modest increase in transportation funding. Table 2.1 provides the estimate of total funding available in each of these two scenarios.

Table 2.1 Available Funding for MoveAZ by Scenario

Scenario	Funding (\$M)
Constrained	8,975
Reasonably Increased Revenues	10,958
<i>Potential Funding Increase</i>	<i>1,983</i>

Source: ADOT, 2004.

Estimates of total funding, as well as project specific costs, were estimated in constant 2004 dollars. This allows ADOT to consistently compare total funding and project funding at any point in time.

■ 2.2 Funding Regions

MoveAZ was designed to work within ADOT's existing institutional framework. The Arizona Transportation Board has ultimate authority to determine a program of funding and MoveAZ follows current Board policy by dividing funding and conducting performance analysis independently for three major regions of the State. Through the recommendation of the Resource Allocation Advisory Committee (RAAC), the Board allocates construction funding into three major regions:

1. Maricopa County;
2. Pima County; and
3. The 13 Other Counties.

Maricopa County receives a total of 37 percent of state funding, Pima receives 13 percent, and 50 percent is provided to the 13 Other Counties. These amounts include major projects and sub-program budgets. MoveAZ uses this existing funding allocation to determine the level of funding for each region through 2025. The project analysis method described below in Section 4.0 evaluates all projects together, but projects are included in the MoveAZ plan separately for each region, in accordance with the available funding for that region.

Projects in the MAG region were identified through the MAG regional transportation plan (RTP). The MAG RTP was adopted by the State Transportation Board in November 2003. As a result, these projects were not analyzed using the methods described below. The methods were only applied to projects in Pima County and the 13 Other Counties.

■ 2.3 Sub-Program and Project Funding

The final step for identifying funding available for projects will be to estimate the allocation between sub-program and major project funding. ADOT funds many transportation improvements through sub-programs that address key functional areas, such as pavement and bridge maintenance, safety, district-identified minor projects, and others. These sub-programs are funded as a whole, with the relevant projects identified by individual sub-program managers and analyzed using sub-program-specific tools and performance measures. For example, the ADOT pavement management system identifies roadway segments that require repaving and estimates the cost to maintain a particular pavement condition standard.

The Arizona Transportation Board sets levels of funding for each of ADOT's sub-programs. In recent years, these funding levels have been fairly stable. For the purpose of the MoveAZ plan, the total funding available for sub-programs is assumed to be constant each year and consistent with established funding levels. Because the MoveAZ plan estimate of total funding available is in constant dollars, using a constant dollar estimate of sub-programs accounts for inflation.

Because MoveAZ uses the RAAC determined allocation of total funding, it was necessary to estimate the allocation between sub-program and major project funding for each of the three regions of the State (Maricopa, Pima, and the 13 Other Counties). Though the specific projects funded by a given sub-program and the level of funding for a particular region will vary from year to year, over several years the distribution of funding across the State will follow the pattern established by the RAAC. Table 2.2 provides a historical estimate of the yearly funding provided to sub-programs for each of the three major regions.

The total funding available for major projects for each region from 2010 to 2025 was derived by estimating total funding, allocating it among the three major regions using the RAAC distribution described above, and subtracting out total sub-program funding in

each region over the same period. The total major project funding identified using this process is provided in Table 2.3.

Table 2.2 Funding for Sub-Programs by Region

Counties	Yearly Funding (2004 \$M)
Maricopa	30.5
Pima	18.5
The 13 Other Counties	171.0
Total	220.0

Source: ADOT, 2004.

Table 2.3 Total Funding for Major Projects and Sub-Programs by Region, 2010 to 2025 (2004 \$ Millions)

Counties	Funding for Major Projects	Funding for Sub-Programs	Total
Maricopa	2,832.7	488.0	3,320.7
Pima	870.7	296.0	1,166.7
The 13 Other Counties	1,751.7	2,736.0	4,487.7
Total	5,455.1	3,520.0	8,975.1

Source: ADOT, 2004.

3.0 Data

3.0 Data

The MoveAZ plan evaluation process integrates data on transportation use, system condition, and other factors to analyze the system performance impacts of proposed transportation projects in Arizona. To support the analysis, the following data sources were used:

- Highway Performance Monitoring System (HPMS);
- Crashes;
- Highway demand and utilization; and
- Proposed project descriptions.

■ 3.1 Highway Performance Monitoring System (HPMS)

The primary data used to support the performance evaluation process was the ADOT 2001 HPMS submittal. HPMS data represent information on roadway structure, performance, and conditions for public roads, and the state transportation system. The data include basic information for all public roads and a set of information for a smaller sample of roads, including traffic volumes, pavement conditions, roadway geometrics, and roadway use.

Each state is required to submit HPMS data to the Federal Highway Administration (FHWA) each year. This submittal is comprised of 98 data items, some of which are required for the universe of public roads, and others that are required only for some functional classes (e.g., the National Highway System) or for “sample” segments. The use of sample segments allows the FHWA to capture more detailed information on a smaller number of segments and to use that data to predict conditions across the nation or for individual states.

ADOT is one of several states that develops a “full sample” HPMS for state-owned roads. This means that ADOT has a complete set of HPMS variables (all 98 data items) for all state-controlled roadway segments. This full sample enabled the MoveAZ plan to evaluate projects across the state transportation system.

For the MoveAZ plan, two versions of the HPMS database were created. The first version was the 2001 HPMS submittal. This submittal represents the most current data about Arizona’s transportation system used for the Plan analysis. The second version of the HPMS data used for MoveAZ was an updated version of the 2001 submittal, including

projects built or programmed since the 2001 submittal. These additional projects were identified from the 2004-2008 Five-Year Transportation Facilities Construction Program. This later data is referred to as the HPMS Existing Plus Committed file.

HPMS data records were thoroughly checked for missing and inconsistent data. This process involved a link-by-link examination of the data items and comparison to other data, where available, focused on the variables most relevant to the evaluation process. Two additional data sources were used to supplement the HPMS: 1) ADOT crash data and 2) highway utilization and demand data generated for MoveAZ. These data items are summarized in later sections.

■ 3.2 Crashes

ADOT collects data on all crashes – property damage only (PDO), injuries, and fatalities – that occur on the Arizona transportation system. These crashes were identified by the road or street they occurred on and the nearest intersection or interchange. The MoveAZ evaluation method predicts crash rates using the Highway Economic Requirements System (HERS) for both the base (2002) and future (2025) conditions (see the *Task 10, Performance Measures Technical Memorandum* for more information). These predicted rates were calibrated to observed crash data to produce a more accurate estimate of expected changes in crash rates.

■ 3.3 Highway Utilization and Demand

The process for estimating travel demand is described in the *Task 9, Demand and System Performance Analysis Technical Memorandum*. This process estimated travel demand and utilization for base (2002) and future (2025) years for all transportation modes. For roadway travel, MoveAZ included estimates of total vehicle miles traveled (VMT) by county and roadway functional class. These estimates were mapped onto the HPMS network to generate segment-level estimates of VMT and annual average daily traffic (AADT) for 2002 and 2025.

■ 3.4 Proposed Project Descriptions

MoveAZ includes a process to identify proposed projects for the performance analysis. This process included reviewing available study and plan documents to identify potential projects, bundling projects into corridor-level projects for analysis, validating costs of

these projects, and reviewing and refining the project bundles and elements with the ADOT district engineers and their staff.

Project Identification

The 1994 ADOT long-range transportation plan identified 33 high-priority corridors for further evaluation. Since that time, ADOT has conducted at least one profile of each of these major corridors. These profiles were prepared to analyze the transportation deficiencies and needs of a particular corridor and identify projects that could alleviate deficiencies. ADOT also conducted small area transportation studies that focus on a smaller region and the region's short- and long-term transportation needs. These two types of studies provided a list of projects for MoveAZ plan evaluations.

Another source of projects was the Vision 21 plan, developed by the Governor's office. This plan included a major effort to identify all transportation needs in the State. The Vision 21 effort identified transportation needs from ADOT's corridor profiles and small area transportation studies, as well as regional and local transportation plans and studies. The resulting database of projects was merged with the projects described above to generate a list of proposed projects for consideration and evaluation in the MoveAZ plan.

Finally, projects in Maricopa County were identified and analyzed by the Maricopa Association of Governments (MAG) Regional Transportation Plan (RTP). The performance analysis process described below was applied only to projects in the remainder of the State. The State Transportation Board adopted in the MAG RTP in November 2003. The MAG RTP was used to identify the specific projects to be funded in Maricopa County over the course of MoveAZ.

Project Bundling

Given the geographic scope and 20-year time period covered by the MoveAZ plan, only transportation projects of substantial size can be analyzed by the performance evaluation method. The projects identified in corridor profiles and other studies, however, included both large and small projects of a variety of types. To ensure that the evaluation process accurately measured the performance impacts of these projects, smaller projects were bundled together with appropriate large and small projects and only these larger bundles were analyzed.

ADOT adopted a set of decision guidelines to bundle projects for evaluation (Figure 3.1). These guidelines were general rules of thumb intended to allow ADOT the flexibility to design bundles appropriate to the circumstances of a particular region or project type. These decision guidelines were applied to the project list to develop bundles. These bundles were then reviewed by ADOT planning staff and district engineers, as described below. The resulting project bundles are provided in Section 6.0 at the end of this report.

Cost Validation

In addition to bundling projects for evaluation, cost estimates for individual projects (that when combined form a bundle) were checked for validity and consistency. Because corridor profiles and other studies were conducted over several years using numerous sources of financial data, there were inconsistencies in the cost estimates. A two part process was used to develop consistent cost estimates. First, unit costs were estimated for types of projects from ADOT's corridor profiles. Project types included highway widening, interchange construction, bridge replacement, and others. Second, these "typical" unit cost estimates were compared to the original cost estimates in meetings with each of the ADOT district engineers to determine the appropriate cost for a particular project. The meetings with the district engineers are described below.

Figure 3.1 MoveAZ Plan Project "Bundling" Decision Guidelines

1. Small cost items within a widening project that are not part of a sub-program will be grouped with the widening.
2. Bridge and pavement preservation projects will be analyzed using management systems and not as capital projects.
 - a. Exception: If a bridge must be replaced due to a road widening or other project, then it will be included in the project bundles.
3. Short widening segments will be grouped together in a corridor if they are nearly adjacent (less than two miles apart).
4. Interchanges and bridge replacement projects will be grouped with widening (or other projects) whenever they overlap or are very close (within two miles).
 - a. Exception: If a corridor study specifies the interchanges or bridges to be altered as part of the widening project, only those interchanges or bridges within the project area will be included.
5. Projects on different roadways that are tightly aligned and have been planned together (according to existing sources) will be grouped as a single project. (Example: Widening projects in downtown Yuma on I-8, B-8, and SR 280.)
6. A group of similar projects that are more than two miles apart may be grouped together if they have been planned to address a single problem. (Example: Climbing lanes that are one to three miles apart.)
7. Total combined project costs will be kept within a reasonable range of about \$50 million. This serves as a guide only, not a rule. For example, if three widenings in a corridor come to \$40 million each, these will be kept separately, rather than combining them into a single \$120 million project.

Source: Cambridge Systematics, Inc., and ADOT, 2003.

The typical unit cost by project type is shown in Table 3.1. Outliers – projects that were noticeably outside of the range of costs of other similar projects – were excluded from this analysis. Because many of the projects are from older studies, the typical unit cost calculation puts more weight on more recent estimates.

Table 3.1 Typical Unit Cost by Project Type for MoveAZ Plan Performance Evaluation

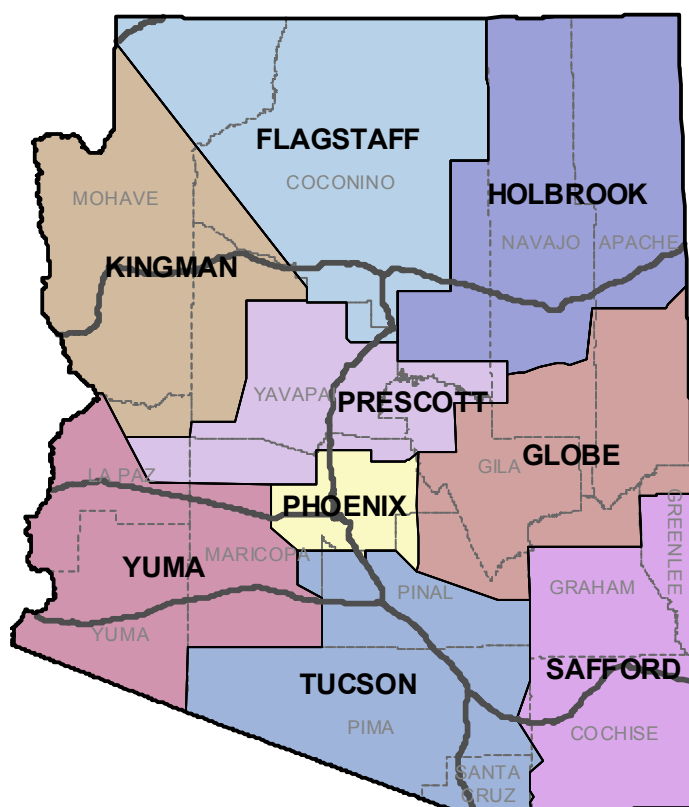
Project Type	Unit Cost Per Project (\$1,000)			
	Typical	Average	Minimum	Maximum
Bridge reconstruction (per bridge)	650	640	150	1,640
Replace bridge (per bridge)	2,000	1,892	1,000	4,200
Port of entry improvements (per POE)	1,500	1,235	300	3,000
Rest area, construct (per rest area)	4,000	3,217	500	6,000
Noise barriers & landscaping (per mile)	1,000	1,000	1,000	1,000
Construct roadway, general (per mile)	3,500	3,232	1,000	9,673
Reconstruct roadway (per mile)	4,000	3,181	410	9,673
Climbing lanes, construct (per mile)	500	587	29	3,200
Passing lanes, construct (per mile)	750	575	45	1,730
Widen roadway/add lane each direction (per mile)	3,000	2,141	258	10,031
Improve curves, horizontal and vertical (per mile)	750	562	500	1,429
Shoulders, improvement, paved to AASHTO standards (per mile)	500	467	18	700
Variable message sign (per VMS)	250	252	52	520
Traffic interchanges, construct (per interchange)	10,000	722	1,000	22,500
Reconstruct interchange (per interchange)	15,000	10,507	1,910	71,850

Source: Cambridge Systematics estimates from ADOT corridor profiles, 2004.

District Engineer Review

The final piece of the MoveAZ project identification and bundling process included meetings with each of ADOT's 10 district engineers. Each of these districts is unique to a particular region of the State, except for Phoenix, which has separate districts for maintenance and engineering (Figure 3.2).

Figure 3.2 ADOT Engineering Districts



Nine meetings were scheduled and held (including a combined Phoenix maintenance and engineering meeting) to provide an opportunity for the ADOT district engineers and staff to engage with the MoveAZ process and to provide the most current information about the projects and programs in their district. The chief engineer and selected staff from each district reviewed all aspects of the project identification process. The review focused on several issues, including:

- Projects that were already completed or superseded by new projects;
- Projects missing from a particular district;
- Verification of project start and end mile points on the transportation system;

- Cost estimates of each project; and
- The appropriateness and accuracy of the project bundles.

At the conclusion of each of these meetings, a final project list was developed for MoveAZ performance evaluations and sent to each of the ADOT district engineers for further review. These final project lists are available in Section 6.0.

4.0 Project Evaluation Process

4.0 Project Evaluation Process

The core of the MoveAZ plan evaluation process is an analysis of the system performance impacts of major transportation projects on the state transportation system. Having identified the funding available to support major projects over the course of the plan and the data necessary to support this process, this section presents the methodology used to perform these project evaluations. The overall goal of this process is to produce a set of scores on seven performance factors that were identified in the MoveAZ strategic direction. The project evaluation process included five basic components:

- **Calculating project performance** – The method for calculating the observed impact of a project on system performance;
- **Performance measure thresholds** – Minimum or maximum thresholds used to establish the need for a particular project;
- **Affected traffic volume** – A second accounting for the need for a particular project, estimated for most measures by the total volume of the affected roadway segments;
- **Measure normalizing** – The method used to normalize raw scores developed from the first three components onto a 10-point scale; and
- **Factor scoring** – The method used to develop scores for each factor on a 10-point scale from the performance measures relevant to each factor.

The following sub-sections describe the performance measures used, the method for deriving the components of the project system performance score, and the method used to normalize performance measures to a common scale and generate scores for each of the factors.

■ 4.1 Calculating Project Performance

The evaluation process is based on 13 performance measures selected to support the MoveAZ plan (Table 4.1). These performance measures were selected through the MoveAZ planning process in conjunction with the ADOT steering committee, the MoveAZ Working Group, and a technical input team that provided advice on measure selection. Detailed descriptions of each of these 13 measures are provided in the *Task 10, MoveAZ Performance Measures Technical Memorandum*.

Table 4.1 MoveAZ Performance Measures

Performance Factor	Performance Measures
Mobility and Economic Competitiveness	<ul style="list-style-type: none"> • Improvement in vehicle-to-capacity (V/C) ratio (weighted average by person miles traveled (PMT)) • Reduction in hours of delay
Connectivity	<ul style="list-style-type: none"> • Ability to pass in major two-lane corridors • Travel time improvement on ADOT high-priority corridors
Safety	<ul style="list-style-type: none"> • Improvement in crash rate (crashes per 100 million VMT) • Reduction in injuries
Reliability	<ul style="list-style-type: none"> • Reduction in hours of incident-related delay
Accessibility	<ul style="list-style-type: none"> • Improvement in bike suitability (from bicycle/pedestrian plan) • Added bus turnouts
Resource Conservation	<ul style="list-style-type: none"> • Reduction in mobile source emissions • Reduction in fuel consumption • Added sound walls • Project consistency with local plans

Source: Cambridge Systematics, 2004.

The 13 measures identified above can be grouped into three basic types:

- Formula-based measures used an ADOT-defined algorithm and any of several data sources to calculate an expected change in performance for a given project “bundle.”
- Several performance measures were calculated using the Highway Economic Requirements System (HERS).
- A small number of measures received only a single point if a project “bundle” had a particular attribute. These measures included the bus turnout, noise walls, and regional plan consistency measures.

For the purposes of the MoveAZ plan, most of the performance measures fall into the first two categories. These measures were first calculated at the district level to determine the “district base performance.” These base performance values were calculated using the 2025 estimates of travel volumes for the entire HPMS network in the district. As described in the previous section, these values were calculated assuming that all currently programmed projects (through 2008) would be built.

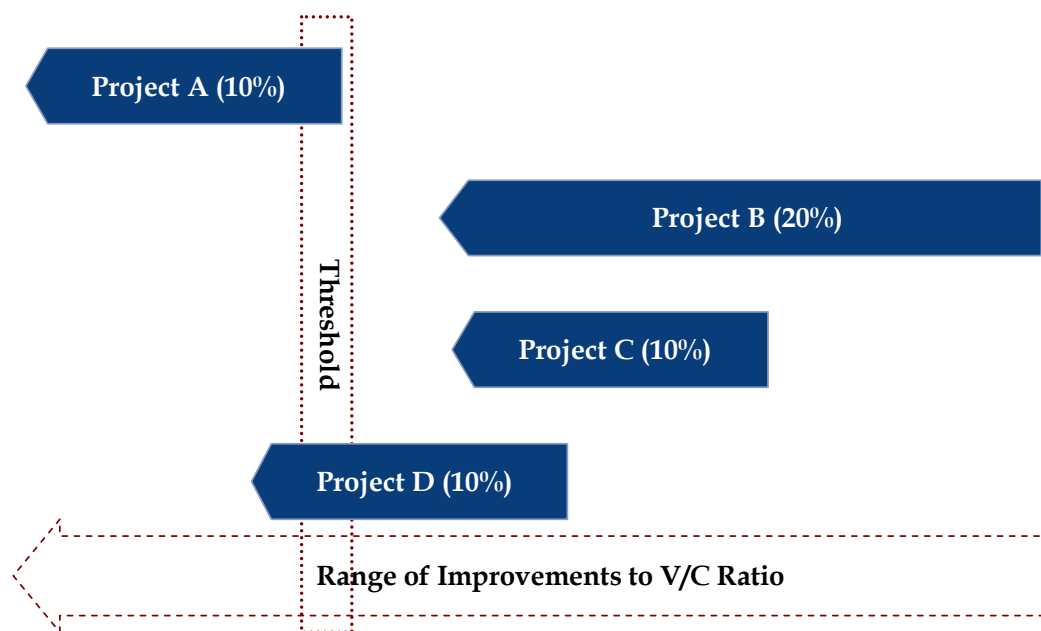
After calculating the district base performance, the HPMS links of a single project “bundle” were updated to reflect the changes proposed by a single project. Then, the performance for the relevant district was recalculated with this new project “bundle” included. This was referred to as the “district plus project performance.” The improvement from the district base performance to the district plus project performance showed the performance gains that resulted from a particular project “bundle”. This process was repeated for each of the project “bundles” in each district to calculate the system performance of each.

Several measures could not be calculated using this method, because they had no natural baseline to be measured against. These included measures of bus turnouts, noise barriers, and consistency with regional transportation plans. These were simple binary measures that were either included or covered by a project “bundle” or not. The performance improvement for these measures was, therefore, a simple binary calculation.

■ 4.2 Performance Measure Thresholds

The performance measures described above provided a raw assessment of the *estimated improvement* that a given project “bundle” would produce. In addition to the performance improvement, the MoveAZ plan evaluation process also accounted for the *need* of a particular project, using two methods. The first of these methods included the application of upper and lower bounds on the particular performance measures. These threshold values ensured that the roadway segments improved by a particular project “bundle” had an actual need. Projects on highway segments above or below a particular threshold were unlikely to show a need for the particular improvement.

For example, one measure of mobility was vehicle congestion, estimated using the volume-to-capacity (V/C) ratio. ADOT had identified level of service (LOS) standards using the V/C ratio by area type. These included LOS C (V/C = 0.71 or lower) for rural highway segments and LOS D (V/C = 0.80 or lower) for urban highway segments. For the MoveAZ plan evaluation process, project “bundles” that reduced the V/C ratio below the relevant urban or rural threshold received a score for only that portion of the improvement down to the threshold. Figure 4.1 represents this concept graphically. Project A, which improved segments already below the threshold, would score no improvement. Project D would score a reduced improvement, because it crossed the thresholds. Projects B and C improved segments, but not quite to the level of the threshold, and the entire performance improvement was calculated in the performance measure score (20 percent for Project B and 10 percent for Project C).

Figure 4.1 Performance Measure Threshold Example

Source: Cambridge Systematics, 2004.

Thresholds were used for several of the performance measures to help ensure that the evaluation process captured the need for a given project, in addition to the performance improvement. Not all of the performance measures used thresholds. Some have no natural upper or lower bound. For example, *reduction in injury crashes* was measured without a threshold, because each additional crash eliminated was as beneficial as the previous. Table 4.2 presents the thresholds used for each measure.

■ 4.3 Affected Traffic Volume

A second method was used to help account for the need of a particular project “bundle.” For several of the measures, the MoveAZ plan evaluation process also accounted for volume of traffic using the segments of roadway affected by the project (project “bundle” AADT). The performance improvement was multiplied by the project “bundle” AADT to generate the performance score.

There were several exceptions to this process. The delay and incident delay measures, which were calculated as hours of delay saved (delay rate multiplied by VMT), were not multiplied by the project AADT. Similarly, the measure of number of injuries reduced by

Table 4.2 MoveAZ Performance Measure Thresholds

Performance Measure	Threshold
<i>Mobility and Economic Competitiveness Factor</i>	
Improvement in V/C	Uses existing ADOT standards: 0.71 for rural highway segments and 0.8 for urban highway segments. A segment that is already below the given threshold scores zero points; segments that are improved below the threshold value will receive the portion of their improvement to the threshold.
Reduction in hours of delay	The threshold is the total delay for a given district in 2002. If a project reduces delay in a given district below the 2002 level, it receives that portion of the improvement down to the 2002 level.
<i>Connectivity Factor</i>	
Ability to pass in major two-lane corridors	The threshold for this measure is set to one, the point at which AADT is equal to passing-lane weighted service volume. Improvements that reduce the ratio below one are scored only to this threshold.
Travel time improvement on ADOT high-priority corridors	The threshold is the 2002 travel time in the affected corridor. If a project reduces the travel time to below the 2002 level, it only receives that portion of the improvement to the 2002 level.
<i>Safety Factor</i>	
Improvement in Crash Rate Reduction in Injuries	No thresholds used.
<i>Reliability Factor</i>	
Reduction in hours of incident-related delay	The threshold is the total incident delay for a given district in 2002. If a project reduces incident delay in a given district below the 2002 level, it only receives that portion of the improvement to the 2002 level.
<i>Accessibility Factor</i>	
Improvement in bike suitability Added bus turnouts	No threshold used.
<i>Resource Conservation Factor</i>	
Reduction in mobile source emissions	The distribution of emissions rates is U-shaped, with peaks at low and high speeds. Projects score on this measure only if they reduce emissions.
Reduction in fuel consumption	The distribution of fuel consumption rates is U-shaped, with peaks at low and high speeds. Projects score on this measure only if they reduce fuel consumption.
Added sound walls Project consistency with local plans	No threshold used.

Source: Cambridge Systematics, 2004.

a project was already calculated using the project “bundle” AADT. The three binary measures – bus turnouts, noise barriers, and regional plan consistency – also did not use the project “bundle” AADT. Finally, the bicycle condition score (BCS) measure used the existing BCS on the affected segments as a measure of need, rather than the project “bundle” AADT. Projects with a low BCS prior to building would receive a higher score than projects with a higher BCS. Using the 2002 BCS for this measure retained the multi-modal nature of the measure.

■ 4.4 Measure Normalizing

To develop consistency in the measures, raw scores on each measure were converted into a normalized score between zero and 10 points. A zero indicated that a given project did nothing to improve a particular measure. The remaining points were assigned to projects relative to the scores of all projects analyzed for MoveAZ.

The scores produced as described above were normalized on a 10-point scale based on their position in the distribution of all project “bundles” on that score. This process is referred to as the percent rank. A project with a score that was better than X percent of all projects on a given measure received a normalized score of $X/10$. For example, a project “bundle” that performed better than 80 percent of all other project “bundles” scored eight points; a project that performed better than half of other projects scored five points; and a project that performed better than only 10 percent of other projects scored a single point. Project “bundles” that provide no performance improvement scored zero points.

This method was applied to reduce the influence of outliers on the scoring scheme. If one or two projects performed much better on a given measure than all other projects, they would not skew the scale. For example, if the third best project scored better than 92 percent of all projects, it received 9.2 points, even if the performance score for the top two projects were substantially larger (i.e., double or greater) than the third best project.

■ 4.5 Factor Scoring

Project “bundles” received a final score on each performance factor as a function of their score on one or more performance measures. Similar to the measures, each of the performance factors was also scored on a 10 point scale. The reliability factor had only one measure, so the factor score was the same as the measure score. For all other factors, multiple measures contributed to the factor score. For most factors, the final score was the average of the measures making up that score, with some exceptions. Table 4.3 describes the procedure for combining each set of measures into a single factor score.

Table 4.3 Performance Factor Scoring Methodology

Performance Factor	Measure Methodology
Mobility and Economic Competitiveness	Average of the two measures
Connectivity	Average of the two measures
Safety	Average of the two measures
Reliability	Single measure
Accessibility	Score of bike suitability measure, plus a single point for any added bus turnouts; maximum of 10 points
Resource conservation	Average of emissions and fuel consumption measures, plus a point each for a project with sound walls or a project that is consistent with local plans; maximum of 10 points

Source: Cambridge Systematics, 2004.

5.0 Weights

5.0 Weights

The final step in the MoveAZ plan evaluation process was the application of performance factor weights to each of the factor scores to generate a total score for each project “bundle.” Weights provided a means to formalize the priorities of the long-range goals and performance factors of the MoveAZ plan. The legislation directing ADOT to develop a long-range plan (House Bill 2660) also required a system of weights to be applied to the performance factors.

A system of weights for each of the seven performance factors (as shown previously in Table 4.1) used in project analysis was developed through public and stakeholder involvement for the plan in coordination with existing ADOT policies and technical concerns. This section describes the process used to develop weights and is divided into the following four subsections:

1. **Weighting methodology** – The overall method used to develop weights;
2. **Sources for weights** – The data used to support the weights;
3. **MoveAZ descriptive weights** – A qualitative description of the weight appropriate to each factor; and
4. **MoveAZ numeric weights** – The translation of the descriptive weights into specific numerical weights for analysis.

■ 5.1 Weighting Methodology

A three-step process was used to develop performance factor weights:

- First, performance factors were identified using the process described above;
- Second, each factor received one of three descriptive weights that represented the relative priority assigned to that factor; and
- Finally, each of the descriptive weights was assigned specific quantitative values that were then applied to the factor scores resulting from the evaluation process.

Three descriptive weights were selected to describe the relative priorities of the factors:

1. **Enhance** was used for factors with the highest priority for ADOT. These were factors that ADOT should focus on to improve system performance, possibly at the expense of other factors.
2. **Sustain** was used for factors for which ADOT should try to maintain current performance levels.
3. **Neutral** was used for all other factors. These factors represented issues that are important, but somewhat less so than other factors.

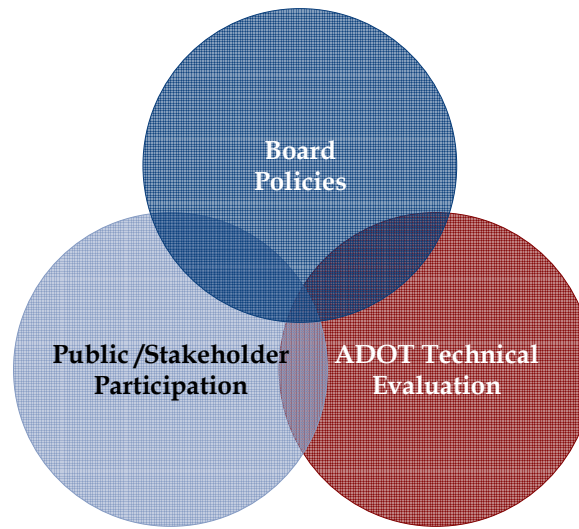
All of the factors selected to be part of the strategic direction are important for project evaluation. The purpose of the strategic direction was to develop long-range goals and performance factors that captured the issues and concerns that ADOT should address over the next 20 years. Though some of these factors are more important than others, the weights were designed to provide relatively small adjustments to the final factor scores.

During the evaluation process, the descriptive weight categories (above) will be translated into numerical weights. The final weights were subject to extensive sensitivity testing in the MoveAZ planning process.

■ 5.2 Sources for Weights

The following major sources were used to develop the performance factor weights (Figure 5.1):

- **Currently adopted board policies** – The Arizona Transportation Board policy document describes the current vision and commitments that the Board makes for transportation in Arizona. It also outlines a set of policies to help meet these commitments.
- **Public input conducted as part of the MoveAZ planning process** – MoveAZ includes three phases of public and stakeholder involvement, two of which occurred prior to finalizing the evaluation process. Through focus groups and regional forums, members of the public were able to help shape the MoveAZ strategic direction. MoveAZ included an analysis of comments made at all of these public events (Initial and Intermediate Partnering Phase Reports), as well as through previous planning processes (MoveAZ Phase I Final Report). Details of this analysis can be found in the corresponding reports for each set of events.
- **Consistency with departmental goals** – The MoveAZ Continuity Team is an internal ADOT committee consisting of representatives of ADOT's major divisions. This group provided guidance on the selection of weights to ensure that the weights fit with existing departmental goals.

Figure 5.1 Sources of MoveAZ Factor Weights

Source: Cambridge Systematics, 2004.

■ 5.3 MoveAZ Descriptive Weights

This section describes the recommended weighting scheme for use in the MoveAZ plan evaluation process. Each of the following subsections describes the basis for assigning a particular descriptive weight to each performance factors. Overall, each of the performance factors received support at all of the regional public forums and in the Arizona Transportation Board policy statement. During the intermediate partnering phase of the MoveAZ plan, participants were asked to select the most important key findings from the initial phase. Across all of the forums, each of the key findings received nearly the same level of support (within two percentage points of the average). The following explanations, then, capture the relatively small differences among the factors that the weights are intended to reveal.

Mobility and Economic Competitiveness – Enhance

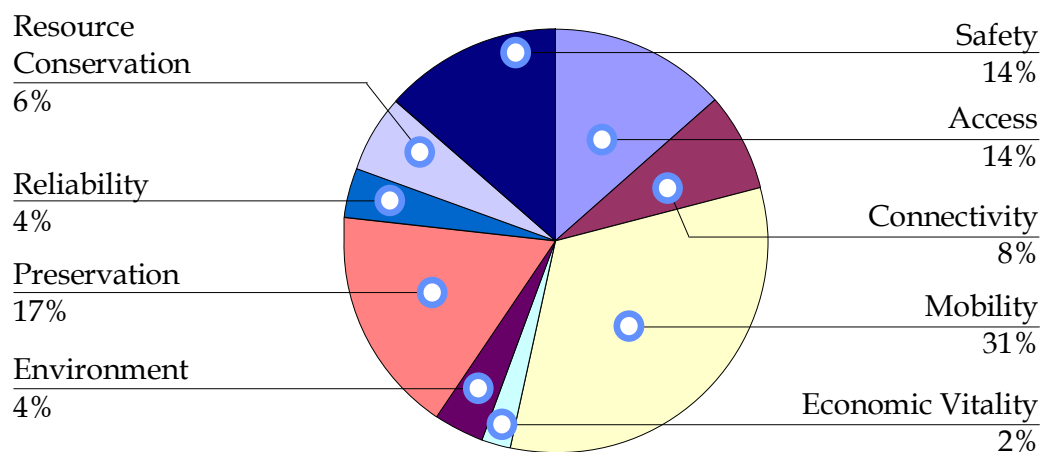
Mobility is one of the primary goals of both ADOT and the traveling public. Through consultation with ADOT staff and in public partnering events, mobility consistently rose as one of the top concerns.

Participants at the regional public forums raised concerns and strategies related to mobility more frequently than all other performance factors during both the initial and

intermediate partnering events. During the initial partnering events, over 40 percent of all participant-ranked responses relating to mobility concerns.

During the intermediate partnering events, the most frequently raised solutions also dealt with mobility issues (Figure 5.2). Participants of the forums held in Globe, Kingman, Prescott, Sierra Vista, Tucson, and Yuma suggested that the MoveAZ Plan should, first and foremost, incorporate projects and programs that enhanced mobility. More than 64 percent of the recommendations made by participants in the Tucson forums noted projects related to mobility as the most significant type of project to the State.

Figure 5.2 Performance Factors Raised During Immediate Partnering Events



Source: Cambridge Systematics, 2004.

Evidence from the review of previous plans also indicated that mobility is a high priority. Nearly all of the plans reviewed discussed mobility in one way or another. Furthermore, economic development issues (which are captured by the same measures as mobility) were also raised frequently in the review of plans. ADOT's small area transportation plans and plans for Indian reservations were particularly interested in the economic impacts of transportation investments.

Accessibility – Sustain

Providing access to the transportation system for multiple users is an important goal for ADOT. This goal received relatively strong support during the public partnering events. It was also consistent with ADOT policy to develop a multimodal transportation system that provides opportunities for all Arizonans to use the transportation system.

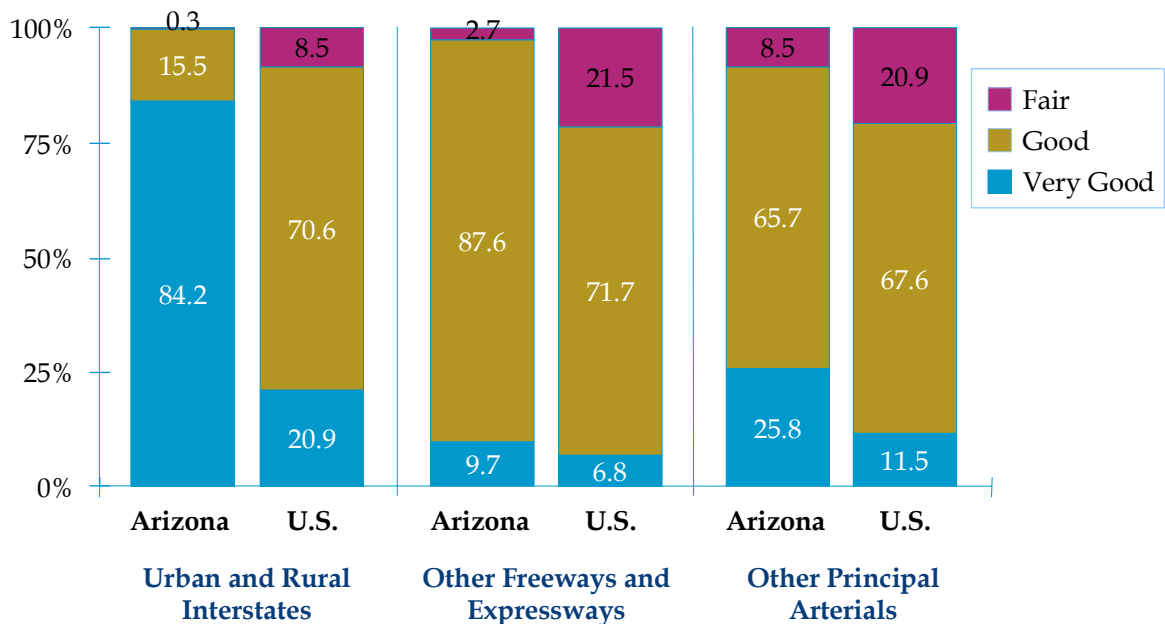
Improving access to the transportation system was strongly encouraged by forum participants. Accessibility concerns and strategies were often raised in conjunction with mobility concerns. Strategies related to accessibility were the third most strongly supported of all strategies raised during the intermediate partnering events. Participants in Flagstaff, Kingman, Pinetop-Lakeside, and Yuma ranked accessibility-related projects strongest of each of the forums, but participants at all forums supported accessibility.

During the initial partnering events, accessibility was second only to mobility in participants' rankings of transportation concerns. The first round of focus groups also provided strong support for accessibility. Participants in the bicycle/pedestrian, human services, economic development, aviation, and Native American communities focus groups all stressed the importance of access to the state transportation system. Several of these groups focused on access to particular modes of travel (aviation and bicycle/pedestrian), while the others were concerned about access to services or jobs, especially for disadvantaged groups.

Preservation – Sustain

Arizona has a history of investing in the maintenance of the transportation system. For example, the condition of pavement in Arizona is substantially better than for the U.S. as a whole (Figure 5.3). This commitment to preservation was supported by participants at public partnering events. Because the quality of maintenance is already quite high, this factor receives a sustain, instead of an enhance.

Figure 5.3 Existing Pavement Quality in Arizona and the U.S.



Source: ADOT, 2004.

Throughout the public and stakeholder involvement process, participants noted satisfaction with the State's current efforts for preservation. During the initial partnering events, participants rarely raised preservation issues as a transportation system concern. According to the survey from the initial phase, over two-thirds of participants thought that the roads were well maintained in Arizona.

In the intermediate partnering phase of MoveAZ, participants voiced concern that building of additional infrastructure should not compromise the high quality of the State's existing transportation network. ADOT was commended for the superior quality of its roadways and was encouraged to maintain this quality. Preservation-related strategies were raised nearly as frequently as accessibility strategies. Though the strong support in the intermediate partnering phase might suggest an "enhance" weight for preservation, the perception that the roadways are already high quality gives preservation a "sustain" weight.

Safety – Enhance

Safety is one of the key goals of for ADOT, Arizonans, and the Federal government. ADOT is committed to reducing crashes and developing a safer transportation system. In public partnering sessions, safety was consistently raised as an issue. Recent concerns at the Federal level have focused attention on the need for improved safety on the transportation system. For these reasons, safety received an enhance rating.

In the public partnering sessions, strategies related to safety were supported across the State. Public involvement participants encouraged ADOT to maintain their existing efforts regarding safety of the transportation system. Strategies related to safety were the fourth most supported type of recommendation, with just under 14 percent of participants across the regional solutions forums supporting these strategies. Transportation safety is a focus of many communities throughout the country, and proved to be of great importance to Arizonans.

During the initial partnering phase, over 75 percent of survey respondents indicated that they feel safe driving on the roads in Arizona. Though they varied by region, well over 50 percent of respondents in every region claimed to feel safe on the roads. At certain forums, safety was identified as a major concern, but this varied considerably by location. In Phoenix and Tucson, survey respondents identified rail-truck conflicts as a source of safety concerns, though other areas did not support this contention.

Resource Conservation – Neutral

Like all of the factors identified for MoveAZ, resource conservation is an important goal for ADOT. Compared to some of the issues raised by other factors, however, resource conservation is somewhat less important. Providing for travel mobility and improving the safety of the transportation system form the core of ADOT policy. Similarly, public

partnering sessions were less likely to point to resource conservation issues. For these reasons, the resource conservation factor receives a neutral rating.

Resource conservation and environmental sensitivity were often raised during the public partnering sessions, but they did not receive the same level of support as other factors across all of the forums. Participants were able to both raise and vote on particular concerns and strategies in the two phases of public involvement. Environmental and resource conservation issues were raised at each of the forums, but only received strong support at select forums. In the initial partnering phase, participants at the Phoenix, Tucson, and Flagstaff forums voted for environmental concerns at a much higher rate than other forums. The intermediate partnering phase events show a similar pattern, with participants of forum in Pinetop-Lakeside also providing strong support for projects related to resource conservation.

Reliability – Neutral

Reliability taps the public's desire for predictability of travel. As a growing state with a rapidly growing transportation system, reliability concerns are somewhat less important than overall mobility. As the Arizona transportation system matures, however, reliability concerns will likely grow. For the MoveAZ plan, reliability received a neutral rating.

Strategies related to reliability received the least public support of all of the factors. Participants did raise concerns about the ability to reliably navigate the roadway system, especially after a serious crash. However, only two percent of participants' votes in the intermediate partnering phase were for reliability issues. Arizonans indicated that they supported maintaining a reliable system, but not necessarily at the cost of pursuing other strategies. When asked on the intermediate partnering phase survey if they would be willing to accept more unpredictable travel times, respondents were split on their decision. Of the questions that asked participants to describe how they would deal with reduced funding, less reliable travel times received more support than most other responses. Only reducing funding to landscaping and aesthetics received more support overall than less predictable travel times.

Connectivity – Neutral

Connectivity is a goal supported by ADOT and at public partnering sessions. Again, however, it received overall less support than other related issues. Connectivity is closely related to other issues, such as mobility and accessibility. But where these issues received substantial public support, the support for connectivity was much more varied.

Strategies related to connectivity often emerged in conjunction with other strategies. For example, as participants discussed the desire to have mobility throughout the State, they sometimes also noted the need to connect various regions. Participants at several forums were especially supportive of connectivity issues. In the initial partnering phase, connectivity was the primary concern of participants at the Lake Havasu City forum. During the

intermediate partnering phase, connectivity was supported most strongly at the Kingman, Yuma, and Phoenix area forums.

During the initial partnering phase, survey respondents were asked if they thought that rural areas were well connected to major transportation systems. Responses to this question varied from a low of 33 percent agreeing in Lake Havasu to nearly 65 percent agreeing in Casa Grande. On average, roughly one-half of all survey respondents thought that rural areas are well connected to the major transportation systems.

Connectivity received relatively less support across all of the forums, compared to other performance factors. Similar to the environmental and resource conservation factors, connectivity received very strong support in some areas and much more tepid support in others. This strategy, therefore, was weighted as neutral, because it is important, but not more so than other strategies.

■ 5.4 MoveAZ Numeric Weights

The final set of weights developed for the MoveAZ performance factors was based on consultations with the ADOT advisory bodies and detailed sensitivity analyses. The objective of using weights in the evaluation process was to provide additional support to projects that perform well on higher-priority factors, such as safety and mobility. However, ADOT recognized that each of performance factors is important for the transportation system. Weights were not intended to cause a radical redistribution of performance to projects. As a result, the weights shown in Table 5.1 provide a moderate boost to project “bundles” that improve mobility, safety, accessibility, and preservation.

Table 5.1 Performance Factors Weights

Performance Factor	Weight
Mobility	1.4
Reliability	1.0
Connectivity	1.0
Accessibility	1.2
Safety	1.4
Preservation	1.2
Resource Conservation	1.0

Source: Cambridge Systematics, 2004.

6.0 Project Bundles

6.0 Project Bundles

The bundles that resulted from the project bundling process (described in Section 4.0) are provided here. These projects constitute the master list of projects that were evaluated in the performance analysis process, provided by district. The projects are organized by bundle – shown in bold – with the elements of each project following the overall bundle. Each project includes the county, roadway, mileposts, a short description, and costs of the project. The bundle description combines the specific descriptions of the individual project elements.

Each bundle is given a code that represents the district and a unique two-digit project number in the format XX.YY. The district codes are given in Table 6.1. For example, 11.21 would be project 21 of the Flagstaff district (Table 6.2). Project elements use the bundle code plus a unique two-digit number for the project element in the format: XX.YY.ZZ. For example, 14.11.01 would be the first project element of the 11th bundle in the Kingman district.

Table 6.1 MoveAZ District Codes

Code	District
11	Flagstaff
12	Globe
13	Holbrook
14	Kingman
15	Phoenix
16	Prescott
17	Safford
18	Tucson
19	Yuma

Tables 6.2 through 6.9 present the project bundles by district that were evaluated in the MoveAZ performance analysis process, including the individual project elements that comprise each bundle. Because projects in Maricopa County were not analyzed using the MoveAZ performance analysis process, they are not shown here. Section 7.0 provides those projects, as well as the performance results for the rest of the State.

Table 6.2 Flagstaff District Projects

Project	Road	BMP	EMP	County	Description	Cost
11.01	I-17	298.98	322.72	Coconino, Yavapai	Climbing lanes, realign highway	\$110,250,000
11.01.01	I-17	298.98	322.72	Coconino, Yavapai	Climbing lanes, animal control	\$68,250,000
11.01.02	I-17	306.30	0.00	Yavapai	Reconstruct TI	\$15,000,000
11.01.03	I-17	317.02	0.00	Coconino	Realign hwy/rebuild bridge	\$6,000,000
11.01.04	I-17	321.98	0.00	Coconino	Realign hwy/rebuild bridge	\$6,000,000
11.01.05	I-17	322.72	0.00	Coconino	Reconstruct TI	\$15,000,000
11.02	I-17	333.85	340.05	Coconino	Widen to 6 lanes	\$35,150,000
11.02.01	I-17	333.85	340.05	Coconino	Widen to 6 lanes	\$20,150,000
11.02.02	I-17	337.39	0.00	Coconino	Reconstruct TI	\$15,000,000
11.11	I-40	155.00	165.00	Coconino	Reconstruct highway	\$14,000,000
11.11.01	I-40	155.00	157.00	Coconino	Reconstruct highway	\$8,000,000
11.11.02	I-40	159.00	165.00	Coconino	Safety project (wild game)	\$6,000,000
11.12	I-40	167.00	196.00	Coconino	Climbing lane, safety	\$84,420,000
11.12.01	I-40	167.00	186.00	Coconino	Safety project (inclement weather/ nighttime)	\$19,000,000
11.12.02	I-40	189.00	193.00	Coconino	Safety project (inclement weather)	\$4,000,000
11.12.03	I-40	194.40	195.40	Coconino	Climbing lane WB	\$1,500,000
11.12.04	I-40	171.65	0.00	Coconino	Reconstruct Pittman TI (widening)	\$15,000,000
11.12.05	I-40	185.11	0.00	Coconino	Reconstruct Transwestern TI (widening)	\$15,000,000
11.12.06	I-40	191.67	0.00	Coconino	Reconstruct W. Flagstaff TI (widening)	\$15,000,000
11.12.07	I-40	195.42	0.00	Coconino	Widen 2 bridges	\$4,000,000
11.12.08	I-40	180.00	185.00	Coconino	Rest area kiosk & CC TV (WB & EB)	\$250,000
11.12.09	I-40	190.00	0.00	Coconino	Variable message sign (EB)	\$250,000
11.12.10	I-40	195.00	195.42	Coconino	Need noise barriers	\$420,000
11.12.11	I-40	196.00	0.00	Coconino	Construct Lone Tree Road interchange	\$10,000,000
11.13	I-40	195.42	205.00	Coconino	Widen to 6 lanes	\$41,180,500
11.13.01	I-40	198.00	199.00	Coconino	Safety project	\$1,000,000
11.13.02	I-40	195.42	200.00	Coconino	District preference CC TV (WB)	\$45,500
11.13.03	I-40	200.00	0.00	Coconino	Variable message sign (WB)	\$260,000
11.13.04	I-40	195.42	201.00	Coconino	Reconstruct and widen to 6 lanes	\$29,295,000
11.13.05	I-40	201.00	202.00	Coconino	Safety project	\$1,000,000
11.13.06	I-40	195.42	205.00	Coconino	Need noise barriers	\$9,580,000
11.16	I-40	226.00	233.88	Coconino	Climbing lane, reconstruct highway	\$25,000,000
11.16.01	I-40	229.00	230.00	Coconino	Safety project (curve)	\$2,000,000
11.16.02	I-40	226.00	230.00	Coconino	Reconstruct and add WB climbing lane	\$8,000,000
11.16.03	I-40	233.88	0.00	Coconino	Reconstruct meteor crater TI	\$15,000,000

Table 6.2 Flagstaff District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
11.21	U.S. 89	442.00	482.00	Coconino	Widen to 4-lane divided	\$130,284,000*
11.21.01	U.S. 89	442.00	442.61	Coconino	Widen to 5-lane undivided section	
11.21.02	U.S. 89	443.21	455.97	Coconino	Widen to 4 lanes divided (84' median)	
11.21.03	U.S. 89	456.61	458.05	Coconino	Widen to 4 lanes (10' shoulders) with raised median, and curb & gutter	
11.21.04	U.S. 89	458.39	463.95	Coconino	Widen to 4 lanes divided	
11.21.05	U.S. 89	466.00	467.11	Coconino	Widen to 4 lanes (10' shoulders) with raised median, and curb & gutter	
11.21.06	U.S. 89	467.60	482.00	Coconino	Widen to 4 lanes divided (84' median)	
11.21.07	U.S. 89	465.20	0.00	Coconino	New TI	
11.21.08	U.S. 89	466.80	0.00	Coconino	New TI	
11.21.09	U.S. 89	480.80	0.00	Coconino	New TI	
11.22	U.S. 89	498.00	504.00	Coconino	Passing lanes	\$1,500,000
11.22.01	U.S. 89	498.00	504.00	Coconino	Construct passing lanes	\$1,500,000
11.23	U.S. 89	531.00	556.99	Coconino	Widen to 4 lanes, passing lanes	\$17,570,000
11.23.01	U.S. 89	531.00	556.99	Coconino	Widen NB shoulder	\$11,000,000
11.23.02	U.S. 89	534.00	536.00	Coconino	Build NB & SB passing lanes	\$1,500,000
11.23.03	U.S. 89	549.54	551.23	Coconino	Construct 4-lane section	\$5,070,000
11.24	U.S. 89A	579.30	613.00	Coconino	Widen to 4 lanes	\$13,708,000
11.24.01	U.S. 89A	612.00	613.00	Coconino	Provide bus turnaround	\$108,000
11.24.02	U.S. 89A	610.20	613.00	Coconino	Widen to 4 lanes	\$9,100,000
11.24.03	U.S. 89A	579.30	609.00	Coconino	Construct passing lanes/pullouts	\$4,500,000
11.24.04	U.S. 89A	N/A	N/A	Coconino	Install bike lanes	
11.31	U.S. 160	336.50	343.50	Coconino	Passing/climbing lanes	\$1,500,000
11.31.01	U.S. 160	336.50	341.50	Coconino	Passing/climbing lanes	\$750,000
11.31.02	U.S. 160	338.50	343.50	Coconino	Passing/climbing lanes	\$750,000
11.32	U.S. 160	321.00	323.00	Coconino	Widen to 5-lane cross section	\$26,500,000
11.32.01	U.S. 160	321.00	323.00	Coconino	Widen to 5-lane cross section	\$6,500,000
11.32.02	U.S. 160	313.00	314.00	Coconino	Add paved shoulders to AASHTO standards	\$500,000
11.32.03	U.S. 160	315.00	321.00	Coconino	Widen to 5-lane cross section	\$19,500,000

Table 6.2 Flagstaff District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
11.41	SR 64	185.70	235.00	Coconino	Widen to 4 lanes, passing/climbing lanes	\$47,400,000
11.41.01	SR 64	185.70	213.00	Coconino	Add paved shoulders to AASHTO standards	\$13,650,000
11.41.02	SR 64	214.00	233.50	Coconino	Add paved shoulders to AASHTO standards	\$9,750,000
11.41.03	SR 64	192.00	197.00	Coconino	Passing/climbing Lanes	\$750,000
11.41.04	SR 64	194.00	199.00	Coconino	Passing/climbing Lanes	\$750,000
11.41.05	SR 64	213.50	218.50	Coconino	Passing/climbing lanes	\$750,000
11.41.06	SR 64	215.50	220.50	Coconino	Passing/climbing lanes	\$750,000
11.41.07	SR 64	213.00	214.00	Coconino	Widen to 5-lane cross-section	\$2,500,000
11.41.08	SR 64	214.00	224.00	Coconino	Add passing lanes at selected locations	\$1,500,000
11.41.09	SR 64	224.00	227.00	Coconino	Add passing lanes at selected locations	\$1,500,000
11.41.10	SR 64	227.00	231.50	Coconino	Add northbound passing lanes at selected locations	\$1,500,000
11.41.11	SR 64	231.50	235.00	Coconino	Widen to 4 lanes plus turn lanes	\$14,000,000
11.51	SR 264	322.00	340.20	Coconino	Widen to 5 lanes, add shoulders, climbing lanes	\$18,060,000
11.51.01	SR 264	322.00	322.90	Coconino	Widen to 5-lane cross section with shoulders	\$2,250,000
11.51.02	SR 264	322.90	340.20	Coconino	Add paved shoulders to AASHTO guidelines	\$12,110,000
11.51.03	SR 264	324.50	329.00	Coconino	Climbing lane – EB	\$2,250,000
11.51.04	SR 264	333.00	333.00	Coconino	Drainage upgrade	\$650,000
11.51.05	SR 264	332.70	333.30	Coconino	Climbing lane – EB	\$300,000
11.51.06	SR 264	322.00	333.30	Coconino	Add bus pullout	\$500,000

*Estimates of individual project elements are not available separately for this bundle.

Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

Table 6.3 Globe District Projects

Project	Road	BMP	EMP	County	Description	Cost
12.01	U.S. 60	212.80	226.80	Pinal	Widen to 5 lanes	\$50,648,000
12.01.01	U.S. 60	222.30	224.70	Pinal	Construct new EB & WB bypass north of the arboretum	\$16,608,000
12.01.02	U.S. 60	224.70	226.80	Pinal	Improve the existing 3-lane to a 5-lane section with portions curbed	\$8,990,000
12.01.03	U.S. 60	212.80	0.00	Pinal	Queen Valley TI	\$10,000,000
12.01.04	U.S. 60	224.50	226.80	Pinal	Provide pedestrian facilities separate from highway	\$50,000
12.01.05	U.S. 60	226.00	0.00	Pinal	Construct new TI @ SR 177	\$15,000,000
12.03	U.S. 60	260.00	273.00	Gila	Passing/climbing lanes	\$2,250,000
12.03.01	U.S. 60	260.00	265.00	Gila	Passing/climbing lanes	\$750,000
12.03.02	U.S. 60	265.00	270.00	Gila	Passing/climbing lanes	\$750,000
12.03.03	U.S. 60	268.00	273.00	Gila	Passing/climbing lanes	\$750,000
12.04	U.S. 60	336.40	402.00	Apache, Navajo	Widen to 5-lanes, add paved shoulders	\$49,179,250
12.04.01	U.S. 60	391.00	392.00	Apache	Add paved shoulders to AASHTO standards	\$500,000
12.04.02	U.S. 60	391.00	392.00	Apache	Add paved shoulders to AASHTO standards	\$500,000
12.04.03	U.S. 60	394.50	395.50	Apache	Add paved shoulders to AASHTO standards	\$500,000
12.04.04	U.S. 60	398.00	399.00	Apache	Add paved shoulders to AASHTO standards	\$500,000
12.04.05	U.S. 60	342.50	402.00	Apache, Navajo	Install delineators along shoulder, entire corridor	\$29,250
12.04.06	U.S. 60	389.00	391.00	Apache	Pavement rehabilitation	\$900,000
12.04.07	U.S. 60	342.50	344.00	Navajo	Construct 4-lane roadway section	\$5,250,000
12.04.08	U.S. 60	344.00	352.00	Navajo	Add paved shoulders to AASHTO standards	\$4,000,000
12.04.09	U.S. 60	352.00	384.00	Apache	Add paved shoulders to AASHTO standards	\$16,000,000
12.04.10	U.S. 60	367.00	389.00	Apache	Pavement rehabilitation	\$9,900,000
12.04.11	U.S. 60	336.40	339.70	Navajo	Widen to 5-lanes	\$11,100,000
12.05	U.S. 60	241.00	242.50	Gila	Passing lanes	\$6,945,000
12.05.01	U.S. 60	241.00	242.50	Gila	Passing lanes, Top of the World	\$6,945,000

Table 6.3 Globe District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
12.06	U.S. 60	252.00	337.00	Gila, Navajo	Climbing lanes, passing lanes	\$28,250,000
12.06.01	U.S. 60	252.00	254.00	Gila	Climbing lanes	\$1,000,000
12.06.02	U.S. 60	260.00	269.00	Gila	Climbing lanes	\$4,500,000
12.06.03	U.S. 60	269.00	272.00	Gila	Climbing lanes	\$1,500,000
12.06.04	U.S. 60	276.00	281.00	Gila	Climbing lanes	\$2,500,000
12.06.05	U.S. 60	281.00	288.00	Gila	Passing lanes	\$1,500,000
12.06.06	U.S. 60	288.00	298.00	Gila	Climbing lanes	\$5,000,000
12.06.07	U.S. 60	299.00	301.00	Gila	Climbing lanes	\$1,000,000
12.06.08	U.S. 60	301.00	312.00	Gila	Passing lanes	\$2,250,000
12.06.09	U.S. 60	312.00	322.00	Gila	Climbing lanes	\$5,000,000
12.06.10	U.S. 60	323.00	326.00	Navajo	Climbing lanes	\$1,500,000
12.06.11	U.S. 60	330.00	334.00	Navajo	Climbing lanes	\$2,000,000
12.06.12	U.S. 60	336.00	337.00	Navajo	Climbing lanes	\$500,000
12.11	U.S. 70	253.60	287.40	Graham, Gila	Widen to 5-lane cross-section	\$66,301,000
12.11.01	U.S. 70	261.00	N/A	Gila	Lengthen passing lane by approx 0.5 mile	\$935,000
12.11.02	U.S. 70	253.60	254.10	Gila	Widen from 2-lane to 5-lane urban	\$45,376,000
12.11.03	U.S. 70	254.10	262.00	Gila	Widen to 4-lane divided	**
12.11.04	U.S. 70	256.00	257.00	Gila	Widen railroad crossing bridge to 5 lanes	\$5,000,000
12.11.05	U.S. 70	271.10	279.40	Graham	Widen shoulders to meet design standards	\$4,150,000
12.11.06	U.S. 70	279.40	287.40	Graham	Widen shoulders to meet design standards	\$4,000,000
12.11.07	U.S. 70	255.60	287.40	Graham, Gila	Repair and maintain fencing	\$2,290,000
12.11.08	U.S. 70	255.60	271.10	Gila	Widen shoulders to meet design standards	\$4,550,000
12.21	SR 73	310.38	335.21	Gila	Shoulders	\$13,108,100
12.21.01	SR 73	310.38	319.84	Gila	Widen shoulders	\$3,108,100
12.21.02	SR 73	319.84	326.08	Gila	Widen shoulders	\$4,800,000
12.21.03	SR 73	326.08	335.21	Gila	Widen shoulders	\$5,200,000
12.31	SR 77	153.00	171.00	Gila	Climbing lanes	\$10,500,000
12.31.01	SR 77	153.00	156.00	Gila	Climbing lanes	\$1,500,000
12.31.02	SR 77	157.00	159.00	Gila	Climbing lanes	\$1,000,000
12.31.03	SR 77	163.00	168.00	Gila	Climbing lanes	\$2,500,000
12.31.04	SR 77	156.00	159.00	Gila	Shoulder improvements	\$1,500,000
12.31.05	SR 77	161.00	162.00	Gila	Shoulder improvements	\$500,000
12.31.06	SR 77	164.00	171.00	Gila	Shoulder improvements	\$3,500,000

Table 6.3 Globe District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
12.32	SR 77	342.00	359.00	Navajo, Gila	Climbing lanes, 5-lane roadway section	\$28,250,000
12.32.01	SR 77	342.00	357.00	Navajo	Climbing lanes	\$7,500,000
12.32.02	SR 77	357.00	359.00	Navajo	Construct 5-lane roadway section	\$7,000,000
12.32.03	SR 77	290.60	0.00	Gila	Runaway truck ramp	\$500,000
12.32.04	SR 77	293.20	0.00	Gila	Runaway truck ramp	\$500,000
12.32.05	SR 77	295.30	0.00	Gila	Runaway truck ramp	\$500,000
12.32.06	SR 77	320.00	323.00	Navajo	Realignment/structure	\$12,000,000
12.32.07	SR 77	321.00	0.00	Navajo	Bridge rehabilitation	\$250,000
12.33	SR 77	342.00	358.00	Navajo	Widen to 4 lanes	\$50,750,000
12.33.01	SR 77	342.00	358.00	Navajo	Widen to 4 lanes	\$48,000,000
12.33.02	SR 77				Rural ITS – Salt River Canyon	\$2,000,000
12.33.03	SR 77				Rural ITS – Salt Show Low to Globe	\$750,000
12.42	SR 260	317.16	335.00	Navajo	Passing lanes	\$3,000,000
12.42.01	SR 260	317.16	317.90	Navajo	Passing/climbing lane (EB) & 5' shoulders	\$1,000,000
12.42.02	SR 260	319.23	320.45	Navajo	Passing/climbing lane (EB) & 5' shoulders	\$1,000,000
12.42.03	SR 260	330.75	332.00	Navajo	Passing/climbing lane (EB) & 5' shoulders	\$1,000,000
12.43	SR 260	331.00	338.00	Navajo	Widen to 5-lane cross section	\$11,518,900
12.43.01	SR 260	331.00	338.00	Navajo	Extend 5-lane roadway	\$11,518,900
12.51	SR 277	331.40	336.40	Navajo	Widen to 5-lane cross-section	\$26,000,000
12.51.01	SR 277	334.90	336.40	Navajo	Widen to 5 lanes	\$10,700,000
12.51.02	SR 277	333.40	334.90	Navajo	Widen to 5 lanes	\$8,700,000
12.51.03	SR 277	331.40	333.40	Navajo	Widen to 5 lanes	\$6,600,000
12.61	SR 79	132.48	150.25	Pinal	Widen to 4 lanes	\$60,000,000
12.61.01	SR 79	132.48	150.25	Pinal	Widen to 4 lanes	\$60,000,000

*Roadway uses new alignment, actual mileposts to be determined.

**Costs included in Item 12.11.02.

Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

Table 6.4 Holbrook District Projects

Project	Road	BMP	EMP	County	Description	Cost
13.03	I-40	282.00	289.00	Navajo	Widen to 6 lanes, noise barriers	\$19,050,000
13.03.01	I-40	285.00	290.00	Navajo	District Preference CC TV (WB) and RWIS	\$750,000
13.03.02	I-40	285.00	290.00	Navajo	VMS at district preference (WB/EB)	\$500,000
13.03.03	I-40	286.60	289.00	Navajo	Design, reconstruct and widen existing road	\$9,600,000
13.03.04	I-40	285.00	286.60	Navajo	Design, reconstruct and widen existing road	\$2,200,000
13.03.05	I-40	282.00	288.00	Navajo	Construct noise barriers	\$6,000,000
13.04	I-40	292.82	311.60	Navajo, Apache	Reconstruct roadway	\$75,185,000
13.04.01	I-40	304.00	0.00	Navajo	Proposed RWIS (WB/EB)	\$65,000
13.04.02	I-40	292.82	311.60	Navajo, Apache	Reconstruct roadway	\$75,120,000
13.05	I-40	311.60	339.52	Apache	Reconstruct roadway	\$127,180,000
13.05.01	I-40	311.60	339.52	Apache	Reconstruct roadway	\$111,680,000
13.05.02	I-40	326.00	0.00	Apache	Reconstruct TI (Navajo)	\$15,000,000
13.05.03	I-40	330.00	0.00	Apache	Variable message sign (WB/EB)	\$500,000
13.06	I-40	339.00	360.00	Apache	Reconstruct roadway	\$112,785,500
13.06.01	I-40	342.00	0.00	Apache	Variable message sign (WB)	\$260,000
13.06.02	I-40	350.00	355.00	Apache	District preference CC TV (WB)	\$45,500
13.06.03	I-40	339.52	360.00	Apache	Reconstruct roadway	\$81,920,000
13.06.04	I-40	339.00	0.00	Apache	Variable message sign (EB)	\$260,000
13.06.05	I-40	345.00	350.00	Apache	RWIS (EB/WB)	\$300,000
13.06.06	I-40	357.50	0.00	Apache	Reconstruct Lupton TI	\$15,000,000
13.06.07	I-40	359.00	0.00	Apache	Reconstruct Window Rock TI	\$15,000,000
13.07	I-40	230.00	233.88	Coconino	Widen to 6 lanes and climbing lane	\$51,620,000
13.07.02	I-40	230.43	0.00	Coconino	Reconstruct Two Guns TI (Widening)	\$15,000,000
13.07.03	I-40	233.88	0.00	Coconino	Reconstruct Meteor Crater TI (Widening)	\$15,000,000
13.07.04	I-40	230.00	233.88	Coconino	Reconstruct and widen to 6 lanes	\$20,370,000
13.07.05	U.S. 95	233.70	0.00	Coconino	Meteor Crater TI UP (WB)	\$1,250,000
13.11	U.S. 160	361.00	384.00	Navajo	Passing lanes	\$7,200,000
13.11.01	U.S. 160	361.00	371.00	Navajo	Add passing lanes at selected locations	\$4,800,000
13.11.02	U.S. 160	381.00	384.00	Navajo	Add passing lanes at selected locations	\$2,400,000
13.21	U.S. 191	344.00	365.00	Apache	Rebuild roadway	\$52,030,000
13.21.01	U.S. 191	352.18	365.00	Apache	Rebuild roadway and improve drainage and isolated intersection improvements	\$51,280,000
13.21.02	U.S. 191	354.00	355.00	Apache	Passing/climbing lanes	\$750,000
13.22	U.S. 191	370.00	379.00	Apache	Rebuild roadway	\$24,000,000
13.22.01	U.S. 191	370.00	371.00	Apache	Rebuild roadway	\$4,000,000
13.22.02	U.S. 191	374.00	379.00	Apache	Rebuild roadway	\$20,000,000

Table 6.4 Holbrook District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
13.23	U.S. 191	379.00	412.00	Apache	Passing lanes, reconstruct roadway	\$133,000,000
13.23.01	U.S. 191	390.00	0.00	Apache	Passing lanes	\$1,000,000
13.23.02	U.S. 191	379.00	412.00	Apache	Rebuild roadway	\$132,000,000
13.24	U.S. 191	420.50	446.50	Apache	Shoulders, reconstruct roadway, widen to 4 lanes	\$62,000,000
13.24.01	U.S. 191	420.50	427.00	Apache	Rebuild roadway and improve drainage	\$26,000,000
13.24.02	U.S. 191	427.00	441.00	Apache	Add paved shoulders to AASHTO standards	\$14,000,000
13.24.03	U.S. 191	441.00	446.50	Apache	Rebuild roadway and widen to 4 lanes	\$22,000,000
13.25	U.S. 191	446.50	510.50	Apache	Widen to 5-lane cross section	\$93,500,000
13.25.01	U.S. 191	449.00	461.00	Apache	Widen to 4-lane divided	\$39,000,000
13.25.02	U.S. 191	462.00	510.00	Apache	Add paved shoulders to AASHTO standards	\$48,000,000
13.25.03	U.S. 191	446.50	448.50	Apache	Widen to 5-lane cross section	\$6,500,000
13.32	SR 264	340.20	388.00	Navajo, Coconino	Shoulders, curves, turn lanes	\$51,002,500
13.32.01	SR 264	340.20	366.80	Coconino, Navajo	Add paved shoulders to AASHTO guidelines	\$18,620,000
13.32.02	SR 264	340.50	340.50	Coconino	Drainage upgrade	\$650,000
13.32.03	SR 264	344.10	344.10	Coconino	Widen intersection for turn lanes	\$500,000
13.32.04	SR 264	350.00	350.00	Coconino	Improve curve to AASHTO guidelines	\$500,000
13.32.05	SR 264	362.50	362.50	Navajo	Improve curve to AASHTO guidelines	\$500,000
13.32.06	SR 264	366.90	366.90	Navajo	Widen intersection for turn lanes	\$500,000
13.32.07	SR 264	366.80	368.00	Navajo	Widen to 3-lane cross section	\$1,560,000
13.32.08	SR 264	368.00	388.00	Navajo	Add paved shoulders to AASHTO guidelines	\$14,000,000
13.32.09	SR 264	368.50	372.70	Navajo	Climbing lane - WB	\$2,100,000
13.32.10	SR 264	371.60	371.60	Navajo	Improve curve to AASHTO guidelines	\$500,000
13.32.11	SR 264	372.10	372.10	Navajo	Improve curve to AASHTO guidelines	\$500,000
13.32.12	SR 264	Howell Mesa		Navajo	Install Road Weather Information System	\$50,000
13.32.13	SR 264	340.20	372.70	Navajo	Add bus pullout	\$812,500
13.32.14	SR 264	374.20	374.20	Navajo	Drainage upgrade	\$650,000
13.32.15	SR 264	375.60	375.60	Navajo	Widen intersection for turn lanes	\$500,000
13.32.16	SR 264	376.40	376.40	Navajo	Improve curve to AASHTO guidelines	\$500,000
13.32.17	SR 264	377.30	379.00	Navajo	Climbing lane - EB	\$850,000
13.32.18	SR 264	378.10	382.6	Navajo	Improve curves to AASHTO guidelines (9 locations)	\$500,000
13.32.21	SR 264	378.80	379.80	Navajo	Widen to 3-lane cross section	\$1,300,000
13.32.22	SR 264	381.20	381.20	Navajo	Widen intersection for turn lanes	\$500,000
13.32.23	SR 264	381.20	383.60	Navajo	Climbing lane - WB	\$1,200,000
13.32.30	SR 264	374.20	382.60	Navajo	Add bus pullout	\$210,000

Table 6.4 Holbrook District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
13.34	SR 264	386.20	411.50	Navajo	Widen to 5-lane cross section with shoulders	\$31,872,500
13.34.01	SR 264	386.20	386.20	Navajo	Widen intersection for turn lanes	\$500,000
13.34.02	SR 264	388.00	393.00	Navajo	Widen to 5-lane cross section with shoulders	\$12,500,000
13.34.03	SR 264	388.90	388.90	Navajo	Realign intersection	\$500,000
13.34.04	SR 264	393.00	396.00	Navajo	Add paved shoulders to AASHTO guidelines	\$2,100,000
13.34.05	SR 264	393.20	393.20	Navajo	Widen intersection for turn lanes	\$500,000
13.34.06	SR 264	395.90	395.90	Navajo	Widen intersection for turn lanes	\$500,000
13.34.07	SR 264	396.00	401.75	Navajo	Add paved shoulders to AASHTO guidelines	\$4,025,000
13.34.08	SR 264	396.90	396.90	Navajo	Widen intersection	\$250,000
13.34.09	SR 264	401.75	403.30	Navajo	Widen to 3-lane cross section	\$2,015,000
13.34.10	SR 264	403.20	411.20	Navajo	Add paved shoulders to AASHTO guidelines	\$5,600,000
13.34.11	SR 264	406.50	408.50	Navajo	Climbing lane – WB	\$1,000,000
13.34.12	SR 264	407.90	407.90	Navajo	Widen intersection for turn lanes	\$500,000
13.34.13	SR 264	409.00	411.50	Navajo	Climbing lane – EB	\$1,250,000
13.34.14	SR 264	386.20	411.50	Navajo	Add bus pullout	\$632,500
13.35	SR 264	411.20	439.40	Apache, Navajo	Climbing lanes, shoulders	\$27,060,000
13.35.01	SR 264	411.20	425.90	Navajo, Apache	Add paved shoulders to AASHTO guidelines	\$10,290,000
13.35.02	SR 264	411.20	411.20	Navajo	Widen intersection for turn lanes	\$500,000
13.35.03	SR 264	418.40	418.40	Navajo	Improve curve to AASHTO guidelines	\$500,000
13.35.04	SR 264	419.30	420.00	Apache	Climbing lane – EB	\$350,000
13.35.05	SR 264	425.00	425.00	Apache	Drainage upgrade	\$650,000
13.35.06	SR 264	425.90	426.70	Apache	Widen to 3-lane cross section	\$1,040,000
13.35.07	SR 264	426.70	441.00	Apache	Add paved shoulders to AASHTO guidelines	\$10,010,000
13.35.08	SR 264	428.00	428.10	Apache	Drainage upgrade	\$65,000
13.35.09	SR 264	429.50	430.50	Apache	Climbing lane – EB	\$500,000
13.35.10	SR 264	430.50	430.50	Apache	Improve curve to AASHTO guidelines	\$500,000
13.35.11	SR 264	430.50	430.50	Apache	Drainage upgrade	\$650,000
13.35.12	SR 264	437.10	437.90	Apache	Climbing lane – EB	\$400,000
13.35.13	SR 264	438.20	438.70	Apache	Climbing lane – WB	\$250,000
13.35.14	SR 264	439.40	439.40	Apache	Drainage upgrade	\$650,000
13.35.15	SR 264	411.20	439.40	Apache, Navajo	Add bus pullout	\$705,000

Table 6.4 Holbrook District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
13.36	SR 264	441.00	446.89	Apache	Widen to 4-lane divided	\$15,572,250
13.36.01	SR 264	441.00	441.00	Apache	Widen intersection for turn lanes	\$500,000
13.36.02	SR 264	441.00	441.80	Apache	Widen to 5-lane cross section with curb/gutter/sidewalk	\$2,000,000
13.36.03	SR 264	441.80	444.70	Apache	Widen to 4-lane divided cross section	\$7,250,000
13.36.04	SR 264	444.23	444.23	Apache	Bridge rehabilitation	\$200,000
13.36.05	SR 264	444.70	446.20	Apache	Widen to 5-lane cross section with shoulders	\$3,750,000
13.36.06	SR 264	446.20	446.89	Apache	Widen to 5-lane cross section with curb/gutter/sidewalk	\$1,725,000
13.36.07	SR 264	441.00	446.89	Apache	Add bus pullout	\$147,250
13.37	SR 264	446.89	473.60	Apache	Widen to 4-lane divided	\$52,054,750
13.37.01	SR 264	446.89	447.60	Apache	Widen to 5-lane cross section with curb/gutter/sidewalk	\$1,775,000
13.37.02	SR 264	447.60	448.60	Apache	Widen to 5-lane cross section with shoulders	\$2,500,000
13.37.03	SR 264	448.00	448.00	Apache	Drainage upgrade	\$650,000
13.37.04	SR 264	448.60	466.00	Apache	Widen to 4-lane divided cross section	\$43,500,000
13.37.05	SR 264	451.30	451.30	Apache	Bridge replacement	\$2,000,000
13.37.06	SR 264	452.10	452.10	Apache	Widen intersection for turn lanes	\$500,000
13.37.07	SR 264	473.60	473.60	Apache	PCCP intersection	\$462,000
13.37.08	SR 264	446.89	473.60	Apache	Add bus pullout	\$667,750
13.41	SR 77	362.00	387.00	Navajo	Climbing lanes	\$13,500,000
13.41.01	SR 77	362.00	387.00	Navajo	Climbing lanes	\$12,500,000
13.41.02	SR 77	366.50	0.00	Navajo	Bridge rehabilitation	\$250,000
13.41.03	SR 77	368.10	0.00	Navajo	Bridge rehabilitation	\$250,000
13.41.04	SR 77	370.80	0.00	Navajo	Bridge rehabilitation	\$250,000
13.41.05	SR 77	379.30	0.00	Navajo	Bridge rehabilitation	\$250,000

Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

Table 6.5 Kingman District Projects

Project	Road	BMP	EMP	County	Description	Cost
14.01	I-40	37.00	44.31	Mohave	Reconstruct and widen to 6 lanes	\$62,895,000
14.01.01	I-40	37.03	0.00	Mohave	Reconstruct Griffith TI (widening)	\$15,000,000
14.01.02	I-40	44.31	0.00	Mohave	Reconstruct McConnico TI	\$15,000,000
14.01.03	I-40	37.00	44.31	Mohave	Reconstruct and widen to 6 lanes	\$32,895,000
14.02	I-40	44.31	55.00	Mohave	Widen to 6 lanes	\$142,355,000
14.02.01	I-40	51.68	0.00	Mohave	Reconstruct Stockton Hill TI (widening)	\$15,000,000
14.02.02	I-40	53.08	0.00	Mohave	Reconstruct E. Kingman TI (widening)	\$15,000,000
14.02.03	I-40	45.00	0.00	Mohave	Variable message sign (EB)	\$250,000
14.02.04	I-40	44.31	55.00	Mohave	Reconstruct and widen to 6 lanes	\$48,105,000
14.02.05	I-40	49.00	53.00	Mohave	Need noise barriers	\$4,000,000
14.02.06	I-40	48.85	0.00	Mohave	Improve West Kingman TI to full directional	\$60,000,000
14.03	I-40	55.00	71.93	Mohave	Widen to 6 lanes	\$107,185,000
14.03.01	I-40	71.00	71.93	Mohave	Safety project	\$1,000,000
14.03.02	I-40	59.65	0.00	Mohave	Reconstruct D W Ranch Rd TI	\$15,000,000
14.03.03	I-40	66.47	0.00	Mohave	Reconstruct Blake Ranch Rd TI	\$15,000,000
14.03.04	I-40	55.00	71.93	Mohave	Reconstruct and widen to 6 lanes	\$76,185,000
14.04	I-40	71.93	89.50	Mohave	Reconstruct highway, climbing lanes	\$34,030,000
14.04.01	I-40	81.50	82.20	Mohave	Climbing lane (WB)	\$350,000
14.04.02	I-40	83.70	84.00	Mohave	Climbing lane (WB)	\$150,000
14.04.03	I-40	87.00	89.50	Mohave	Construct climbing lane (EB)	\$1,250,000
14.04.04	I-40	71.93	79.00	Mohave	Reconstruct highway	\$28,280,000
14.04.05	I-40	84.00	85.00	Mohave	Reconstruct highway	\$4,000,000
14.05	I-40	91.70	120.00	Yavapai	Widen to 6 lanes	\$111,390,000
14.05.01	I-40	91.70	94.00	Yavapai	Reconstruct and widen to 6 lanes	\$10,350,000
14.05.02	I-40	103.58	110.50	Yavapai	Reconstruct highway	\$27,680,000
14.05.03	I-40	115.00	120.00	Yavapai	Variable message sign (EB)	\$250,000
14.05.04	I-40	96.02	0.00	Yavapai	Reconstruct Cross Mountain TI	\$15,000,000
14.05.05	I-40	103.58	0.00	Yavapai	Reconstruct Jolly Rd TI (due to road widening)	\$15,000,000
14.05.06	I-40	94.00	103.58	Yavapai	Reconstruct and widen to 6 lanes	\$43,110,000
14.06	I-40	123.40	144.94	Yavapai	Reconstruct highway	\$86,160,000
14.06.01	I-40	123.40	144.94	Yavapai	Reconstruct highway	\$86,160,000
14.11	U.S. 93	2.50	17.00	Mohave	Widen to 4 lanes	\$47,125,000
14.11.01	U.S. 93	2.50	17.00	Mohave	Widen to 4 lanes (near Hoover Dam)	\$47,125,000

Table 6.5 Kingman District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
14.12	U.S. 93	92.50	121.30	Mohave	Widen to 4 lanes	\$250,217,000
14.12.01	U.S. 93	92.50	95.10	Mohave	Widen to 4 lanes (design, construct, ROW)	\$10,515,000
14.12.02	U.S. 93	104.10	106.00	Mohave	Widen to 4 lanes (design, construct, ROW)	\$5,491,000
14.12.03	U.S. 93	101.80	104.10	Mohave	New 4-lane alignment (design, construct, ROW)	\$21,805,000
14.12.04	U.S. 93	108.90	113.00	Mohave	Widen to 4 lanes (design, construct, ROW)	\$13,602,000
14.12.05	U.S. 93	113.00	116.30	Mohave	Widen to 4 lanes (design, construct, ROW)	\$12,903,000
14.12.06	U.S. 93	116.30	119.70	Mohave	New 4-lane alignment (design, construct, ROW)	\$23,475,000
14.12.07	U.S. 93	106.00	108.90	Mohave	New 4-lane alignment (design, construct, ROW)	\$22,183,000
14.12.08	I-40				Cedar Hills interchange	\$16,012,000
14.12.09	U.S. 93	91.20			New U.S. 93/I-40 interchange	\$16,591,000
14.12.10	U.S. 93	121.30	125.20	Mohave	Wickieup bypass + new 4-lane alignment	\$45,654,000
14.12.11	U.S. 93	92.50	98.20	Mohave	Reconstruct existing segment	\$17,045,000
14.12.12	U.S. 93	98.20	101.80	Mohave	Reconstruct existing segment	\$12,147,000
14.12.13	U.S. 93	119.70	121.30	Mohave	Reconstruct existing segment	\$6,420,000
14.12.14	U.S. 93	104.10	106.00	Mohave	Reconstruct existing segment	\$4,358,000
14.12.15	U.S. 93	108.90	113.00	Mohave	Reconstruct existing segment	\$11,489,000
14.12.16	U.S. 93	113.00	116.30	Mohave	Reconstruct existing segment	\$10,527,000
14.13	U.S. 93	161.71	182.90	Yavapai	Widen to 4 lanes	\$84,760,000
14.13.01	U.S. 93	161.71	182.90	Yavapai	Widen to 4 lanes	\$84,760,000
14.21	SR 95	163.50	172.30	Mohave	Passing lanes	\$1,750,000
14.21.01	SR 95	148.00	153.00	Mohave	New signs on SR 95	\$250,000
14.21.02	SR 95	163.50	168.50	Mohave	Passing/climbing lanes	\$750,000
14.21.03	SR 95	167.30	172.30	Mohave	Passing/climbing lanes	\$750,000
14.22*	SR 95	175.00	202.00	Mohave	Widen to 4 lanes	\$42,000,000
14.22.01	SR 95	175.00	177.00	Mohave	Widen to 4 lanes	\$6,000,000
14.22.02	SR 95	191.00	202.00	Mohave	Widen to 4 lanes	\$36,000,000

* ADOT is currently developing an Access Management Study for this roadway that will update potential projects.

Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

Table 6.6 Prescott District Projects

Project	Road	BMP	EMP	County	Description	Cost
16.02	I-17	244.00	262.65	Yavapai	Widen to 6 lanes	\$60,612,500*
16.02.01	I-17	244.00	262.65	Yavapai	Widen, rural ITS other	
16.02.02	I-17	244.44	252.52	Yavapai	New lanes, rockfall containment, other	
16.03	I-17	278.00	286.00	Yavapai	Widen to 8 lanes	\$80,250,000
16.03.01	I-17	278.00	286.00	Yavapai	Widen to 8 lanes	\$80,250,000
16.04	I-17	286.00	298.98	Yavapai	Widen to 6 lanes	\$81,930,000
16.04.01	I-17	286.00	298.98	Yavapai	Widen	\$81,930,000
16.21	SR 69	281.00	296.00	Yavapai	Widen to 6 lanes	\$48,750,000
16.21.01	SR 69	281.00	296.00	Yavapai	Widen to 6 lanes	\$48,750,000
16.41	SR 89	314.02	330.18	Yavapai	Widen to 4 lanes, 5 lanes	\$44,000,000
16.41.01	SR 89	314.02	316.07	Yavapai	Widen to 4 lanes	\$8,000,000
16.41.02	SR 89	320.04	325.00	Yavapai	Widen to 4 lanes	\$18,000,000
16.41.03	SR 89	325.00	330.18	Yavapai	Widen to 5-lane cross-section	\$18,000,000
16.42	SR 89A	320.96	329.90	Yavapai	Widen to 4 lanes	\$29,055,000
16.43.01	SR 89A	320.96	329.90	Yavapai	Widen to 4 lanes	\$29,055,000
16.51	SR 260	208.60	228.00	Yavapai	Widen to 4 lanes	\$122,199,800
16.51.01	SR 260	208.60	212.90	Yavapai	Widen to 4 lanes divided	\$26,510,600
16.51.02	SR 260	212.90	218.40	Yavapai	Reconstruct roadway	\$26,590,700
16.51.03	SR 260	218.40	222.00	Yavapai	Construct 4-lane divided	\$9,369,500
16.51.04	SR 260	222.00	228.00	Yavapai	Reconstruct to 4-lane divided highway	\$59,729,000
16.52	SR 260	256.00	282.00	Gila	Widen to 4 lanes	\$15,412,000
16.52.01	SR 260	256.00	260.00	Gila	Widen from 2 lanes to 4 lanes	\$15,412,000
16.53	SR 260	282.00	302.00	Coconino, Navajo	Widen to 4 lanes	\$104,000,000
16.53.01	SR 260	282.00	288.00	Coconino	Reconstruct 2 lanes to 4 lanes	\$24,000,000
16.53.02	SR 260	288.00	293.00	Coconino, Navajo	Widen	\$20,000,000
16.53.03	SR 260	293.00	302.00	Navajo	Reconstruct 4 lanes	\$36,000,000
16.53.04	SR 260	295.00	301.00	Navajo	New WB lanes	\$24,000,000

*Estimates of individual project elements are not available separately for this bundle.

Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

Table 6.7 Safford District Projects

Project	Road	BMP	EMP	County	Description	Cost
17.01	I-10	288.78	303.00	Pima, Cochise	Widen to 6 lanes	\$46,215,000
17.01.01	I-10	288.78	303.00	Pima, Cochise	Widen to 6 lanes	\$46,215,000
17.02	I-10	310.00	325.00	Cochise	Climbing lanes	\$21,000,000
17.02.01	I-10	310.00	311.00	Cochise	Climbing lanes (EB)	\$3,000,000
17.02.02	I-10	316.00	319.00	Cochise	Climbing lanes (EB)	\$9,000,000
17.02.03	I-10	322.00	325.00	Cochise	Climbing lanes (WB)	\$9,000,000
17.11	U.S. 70	287.40	329.80	Graham	Shoulders, headwalls	\$11,264,000
17.11.01	U.S. 70	287.40	300.10	Graham	Repair and maintain fencing	\$914,000
17.11.02	U.S. 70	287.40	300.10	Graham	Repair shoulders to meet design standards	\$6,350,000
17.11.03	U.S. 70	300.10	329.80	Graham	Move headwalls back to a safe distance from road	\$4,000,000
17.12	U.S. 70	335.30	349.50	Graham	Widen to 4 lanes divided	\$19,000,000
17.12.01	U.S. 70	340.00	346.20	Graham	Widen to 5 lanes, new bridge on San Simon River	\$12,000,000
17.12.02	U.S. 70	346.20	349.50	Graham	Widen to 4 lanes divided	\$7,000,000
17.21	U.S. 191	87.40	104.50	Graham	Shoulders	\$8,650,000
17.21.01	U.S. 191	87.40	92.70	Graham	Widen SB shoulder (NB traffic will use new roadway programmed for 2003)	\$2,650,000
17.21.02	U.S. 191	92.50	97.80	Graham	Widen shoulders as recommended in U.S. 191 Master Plan Study (1997)	\$2,650,000
17.21.03	U.S. 191	97.80	100.70	Graham	Widen SB shoulder (NB traffic will use new roadway programmed for 2003)	\$1,450,000
17.21.04	U.S. 191	100.70	104.50	Graham	Widen shoulders to meet design standards	\$1,900,000
17.22	U.S. 191	111.00	121.00	Graham	Widen to 5-lane cross section	\$34,162,000
17.22.01	U.S. 191	111.00	118.20	Graham	Widen from 2-lane to 5-lane urban section	\$24,309,000
17.22.02	U.S. 191	118.20	121.00	Graham	Realign/reconstruct to remove S-curve & provide uniform 5-lane section	\$9,853,000
17.23	U.S. 191	130.80	144.10	Graham	Climbing lanes	\$22,202,000
17.23.01	U.S. 191	139.00	144.10	Graham	Construct a 1.5 to 2-mile NB climbing lane, to complement climbing lanes	\$5,402,000
17.23.02	U.S. 191	335.30	340.10	Graham	Construct bypass to a) U.S. 191 S of Safford or b) E end of SR 366	\$16,800,000
17.24	U.S. 191	154.50	165.50	Greenlee	Shoulders	\$24,500,000
17.24.01	U.S. 191	154.50	154.50	Greenlee	Raise Cold Creek bridge 12-20 feet and lower intersection 3 feet	\$5,000,000
17.24.02	U.S. 95	154.80	157.00	Greenlee	Widen shoulder to meet design standards	\$5,500,000
17.24.03	U.S. 191	156.90	162.50	Greenlee	Widen shoulder to meet design standards	\$14,000,000

Table 6.7 Safford District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
17.25	U.S. 191	23.46	27.00	Cochise	Roadway reconstruction, widen to 4 lanes	\$14,160,000
17.25.01	U.S. 191	23.46	27.00	Cochise	Roadway reconstruction, widen to 4 lanes	\$14,160,000
17.26	U.S. 191	45.69	65.00	Cochise	Roadway reconstruction	\$77,240,000
17.26.02	U.S. 191	45.69	55.70	Cochise	Roadway reconstruction, drainage improve	\$40,040,000
17.26.03	U.S. 191	55.70	65.00	Cochise	Roadway reconstruction, drainage improve, roadway realignment, bridge replacement	\$37,200,000
17.31	SR 80	294.66	299.78	Cochise	Widen to 5-lane cross section	\$37,640,000
17.31.01	SR 80	294.66	299.78	Cochise	Widen to 5-lane cross section	\$16,640,000
17.31.02	SR 80	294.00	0.00	Cochise	Traffic interchange	\$10,000,000
17.31.03	B 10	S 80/ B10 TI	I10/ B10 TI	Cochise	Widen to 5 lanes	\$5,000,000
17.31.04	SR 80	299.00	302.00	Cochise	Widen to 3-lane cross section	\$6,000,000
17.41	S 90	322.53	336.40	Cochise	Widen to 4 lanes, 5-lane cross-section	\$45,077,500
17.41.01	S 90	322.53	328.00	Cochise	Widen to 5-lane cross-section	\$17,777,500
17.41.02	S 90	328.00	336.40	Cochise	Widen to 4 lanes	\$27,300,000
17.51	SR 92, 90	321.21	325.22	Cochise	Widen to 6 lanes divided	\$14,140,000*
17.51.01	SR 90	320.65	321.52	Cochise	Widen to 6 lanes divided	
17.51.02	SR 92	321.21	325.22	Cochise	Widen to 6 lanes divided	
17.52	SR 92	352.00	354.86	Cochise	Widen to 4 lanes, 5 lanes	\$6,023,000*
17.52.01	SR 92	351.56	352.47	Cochise	Widen 2 to 5 lanes symmetrically with curb and gutter	
17.52.02	SR 92	352.87	354.57	Cochise	Reconstruct existing 2-lane roadway to 5-lane asymmetrically with curb and gutter	
17.52.03	SR 92	354.57	354.86	Cochise	Widen 2 to 4 lanes asymmetrically with curb, gutter and sidewalk	
17.52.04	SR 92	354.86	0.00	Cochise	Widen to 5 lanes	
17.53	SR 92, 90	321.21	321.84	Cochise	Widen to 6 lanes divided	\$4,240,000*
17.53.01	SR 90	321.24	321.52	Cochise	Widen to 6 lanes divided	
17.53.02	SR 92	321.21	321.84	Cochise	Widen to 6 lanes divided	
17.61	SR 266	104.60	123.80	Graham	Shoulders	\$4,795,000
17.61.01	SR 266	104.60	123.80	Graham	Widen shoulders to meet design standards	\$4,795,000
17.71	SR 366	136.70	143.20	Graham	Reconstruct, pave road	\$15,418,000
17.71.01	SR 366	136.70	143.20	Graham	Reconstruct as paved roadway with no shoulders & improved drainage	\$15,418,000

*Estimates of individual project elements are not available separately for this bundle.

Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

Table 6.8 Tucson District Projects

Project	Road	BMP	EMP	County	Description	Cost
18.01	I-10	175.80	226.00	Pinal	Widen to 6 lanes	\$163,150,000
18.01.01	I-10	175.80	226.00	Pinal	Widen to 6 lanes	\$163,150,000
18.02	I-10	240.40	252.40	Pima	Widen to 8 lanes	\$159,639,908
18.02.01	I-10	240.40	252.40	Pima	Widen to 8 lanes (roadway, earthwork)	\$61,807,378
18.02.02	I-10	240.40	252.40	Pima	Replace roadway and railroad structures, retaining walls	\$40,623,140
18.02.03	I-10	240.40	252.40	Pima	Repair/replace drainage	\$40,389,724
18.02.04	I-10	240.40	252.40	Pima	Signing, lighting, signals	\$3,032,500
18.02.05	I-10	240.40	252.40	Pima	Right-of-way	\$3,772,961
18.02.06	I-10	240.40	252.40	Pima	Landscaping	\$10,014,205
18.03	I-10	275.49	288.78	Pima	Widen to 6 lanes	\$36,782,500
18.03.01	I-10	275.49	279.40	Pima	Widen to 6 lanes	\$12,707,500
18.03.02	I-10	281.68	288.78	Pima	Widen to 6 lanes	\$23,075,000
18.03.03	I-10	289.20	0.00	Pima	Structure	\$1,000,000
18.04	I-10	262.52	275.98	Pima	Widen to 6 lanes	\$43,745,000
18.04.01	I-10	262.52	275.98	Pima	Widen to 6 lanes	\$43,745,000
18.13	I-19*	63.58	91.10	Pima	Widen to 4 lanes, 6 lanes	\$300,220,000**
18.13.01	I-19*	63.58	75.43	Pima	Widen to 4 lanes & auxiliary lanes in each direction	
18.13.02	I-19*	75.43	91.10	Pima	Reconstruct or widen to 3 lanes & auxiliary lanes in each direction	
18.13.03	I-19*			Pima	Reconstruct 7 TIs (Ajo Way, Irvington, San Xavier, Papago, Sahuarita, Duval Mine, Esperanza)	
18.13.04	I-19*			Pima	2 TI improvements (Continental, Canoa)	
18.13.05	I-19*			Pima	2 New TI s (Drexel, Los Reales)	
18.13.06	I-19*			Pima	Frontage Roads	
18.13.08	I-19*			Pima	Right-of-way acquisition	
18.13.09	I-19*			Pima	Drainage improvements	
18.13.09	I-19*			Pima	Noise walls	
18.22	SR 77	92.00	95.22	Pinal	Climbing and passing lanes	\$1,286,500
18.22.01	SR 77	91.28	91.87	Pinal	Passing lanes and shoulder improvement (8')	\$471,440
18.22.02	SR 77	94.20	95.22	Pinal	Passing lanes and shoulder improvement (8')	\$815,060
18.31	SR 85	32.54	80.69	Pima	Widen roadway to standards	\$86,670,000
18.31.01	SR 85	32.54	80.69	Pima	Widen roadway (standards), safety	\$86,670,000
18.41	SR 86	52.90	113.90	Pima	Reconstruct roadway to 38-foot cross-section	\$78,800,000
18.41.01	SR 86	52.90	92.30	Pima	Reconstruct roadway to 38-foot cross-section	\$78,800,000

Table 6.8 Tucson District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
18.42	SR 86	92.30	141.40	Pima	Reconstruct roadway to 40' cross-section	\$61,900,000
18.42.03	SR 86	128.50	132.80	Pima	4.3 miles offset widening	\$6,600,000
18.42.04	SR 86	124.50	128.50	Pima	4 miles offset widening	\$5,800,000
18.42.05	SR 86	120.20	124.50	Pima	4.3 miles Offset widening, widen bridge at MP 122.1	\$6,600,000
18.42.06	SR 86	116.10	120.20	Pima	2.65 miles symmetrical widening, 1.45 miles offset widening	\$5,600,000
18.42.07	SR 86	109.30	113.10	Pima	1.78 miles new roadway, 2.02 miles symmetrical widening, new drainage structures	\$6,700,000
18.42.08	SR 86	106.10	109.30	Pima	2.43 miles new roadway, 0.77 miles symmetrical widening, 1.63 miles detour, new drainages structures	\$6,500,000
18.42.09	SR 86	103.10	106.10	Pima	1.63 miles new roadway, 1.37 miles widening, 0.91 miles detour, new drainage structures	\$6,000,000
18.42.10	SR 86	100.83	103.10	Pima	0.99 miles new roadway, 1.28 miles symmetrical widening, new drainage structures	\$4,800,000
18.42.11	SR 86	98.30	100.14	Pima	1.23 miles new roadway, 0.61 miles symmetrical widening, new drainage structures	\$3,700,000
18.42.12	SR 86	94.30	97.90	Pima	0.83 miles new roadway, 2.77 miles symmetrical widening, new drainage structure	\$5,600,000
18.42.13	SR 86	92.30	94.30	Pima	0.76 miles new roadway, 0.24 miles symmetrical widening, new drainage structure	\$4,000,000
18.43	SR 86	150.10	171.90	Pima	Widen to 6 lanes, 4 lanes	\$22,700,000
18.43.01	SR 86	169.90	171.90	Pima	Widen from 4 to 6 lanes	\$6,500,000
18.43.02	SR 86	150.10	159.50	Pima	Widen to 4-lane divided	\$16,200,000
18.51	SR 87	134.76	141.18	Pinal	Widen to 4 lanes	\$38,000,000
18.51.01	SR 87	134.76	141.18	Pinal	Widen to 4 lanes	\$28,000,000
18.51.01	SR 87			Pinal	New TI	\$10,000,000
18.61	SR 287	134.75	142.76	Pinal	Widen to 4 lanes, replace railroad bridge	\$56,000,000
18.61.01	SR 287	134.75	142.76	Pinal	Widen to 4 lanes, replace railroad bridge	\$36,000,000
18.61.01	SR 287			Pinal	2 new TIs	\$20,000,000

* Listed projects are in kilometer posts, not mileposts. I-19 is the only U.S. Interstate marked in kilometer posts.

**Estimates of individual project elements are not available separately for this bundle.

Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

Table 6.9 Yuma District Projects

Project	Road	BMP	EMP	County	Description	Cost
19.01	I-8	2.23	12.21	Yuma	Widen to 6 lanes	\$55,020,000
19.01.01	I-8	2.23	12.21	Yuma	Widen	\$39,920,000
19.01.02	I-8	9.40	0.00	Yuma	Interchange reconstruction	\$15,000,000
19.01.03	I-8	7.63	0.00	Yuma	Interchange improvements	\$10,000
19.01.04	I-8	7.67	0.00	Yuma	Bridge reconstruction	\$45,000
19.01.05	I-8	7.67	0.00	Yuma	Bridge reconstruction	\$45,000
19.02	I-8	17.00	20.40	Yuma	Shoulders/geometry/sight distance	\$1,950,000
19.02.01	I-8	17.00	20.40	Yuma	Shoulders/geometry/sight distance	\$1,700,000
19.02.02	I-8	18.88	0.00	Yuma	Truck warning system	\$250,000
19.21	U.S. 95	26.00	31.80	Yuma	Widen to 6 lanes	\$18,850,000
19.21.01	U.S. 95	26.00	31.80	Yuma	Widen to 6 lanes	\$18,850,000
19.22	U.S. 95	26.00	31.80	Yuma	Add 2-way left-turn lane	\$1,500,000
19.22.01	U.S. 95	26.00	31.80	Yuma	Add 2-way left-turn lane	\$1,500,000
19.23	U.S. 95	31.80	70.00	Yuma, La Paz	Widen to 4 lanes	\$116,600,000
19.23.02	U.S. 95	31.80	47.00	Yuma	Widen to 4 lanes	\$45,600,000
19.23.03	U.S. 95	47.00	70.00	Yuma	Widen to 4 lanes	\$69,000,000
19.23.04	U.S. 95	38.00	0.00	Yuma	Replace bridge	\$2,000,000
19.24	U.S. 95	44.50	99.00	Yuma, La Paz	Passing/climbing lanes	\$9,000,000
19.24.01	U.S. 95	44.50	49.50	Yuma	Passing/climbing lanes (2 miles)	\$1,500,000
19.24.03	U.S. 95	67.50	72.50	La Paz	Passing/climbing lanes (2 miles)	\$1,500,000
19.24.05	U.S. 95	77.00	82.00	La Paz	Passing/climbing lanes (2 miles)	\$1,500,000
19.24.07	U.S. 95	82.00	87.00	La Paz	Passing/climbing lanes (2 miles)	\$1,500,000
19.24.09	U.S. 95	89.00	94.00	La Paz, Yuma	Passing/climbing lanes (2 miles)	\$1,500,000
19.24.11	U.S. 95	94.00	99.00	La Paz	Passing/climbing lanes (2 miles)	\$1,500,000
19.31	SR 72	13.00	49.90	La Paz	Shoulders, horizontal and vertical curves	\$59,240,000
19.31.01	SR 72	13.11	49.91	La Paz	Construct shoulders	\$18,400,000
19.31.02	SR 72	49.90	0.00	La Paz	Intersection improvement	\$400,000
19.31.03	SR 72	19.00	32.50	La Paz	Improve vertical curves	\$10,125,000
19.31.04	SR 72	19.00	32.50	La Paz	Improve horizontal curves	\$10,125,000
19.31.05	SR 72	36.00	47.00	La Paz	Improve vertical curves	\$8,250,000
19.31.06	SR 72	36.00	47.00	La Paz	Improve horizontal curves	\$8,250,000
19.31.07	SR 72	13.00	49.90	La Paz	Bike lane/shoulder	\$3,690,000
19.51	SR 95	131.00	147.70	La Paz	Widen to 6 lanes, passing lanes	\$6,575,000
19.51.01	SR 95	143.10	144.20	La Paz	Widen to 6 lanes	\$3,575,000
19.51.02	SR 95- 134 NB	131.00	142.00	La Paz	Passing/climbing lanes	\$2,250,000
19.51.03	SR 95- 134 SB	133.00	138.00	La Paz	Passing/climbing lanes	\$750,000

Table 6.9 Yuma District Projects (continued)

Project	Road	BMP	EMP	County	Description	Cost
19.52	SR 95	147.70	161.71	La Paz	Add center turn lane	\$31,650,000
19.52.01	SR 95	147.70	161.71	La Paz	Add center turn lane	\$31,400,000
19.52.02	SR 95	148.00	153.00	La Paz	New signs on SR 95	\$250,000
19.53	SR 95	110.00	131.00	La Paz	Widen roadway to 40' cross section	\$10,500,000
19.53.01	SR 95	N/A	N/A	La Paz	Drainage	
19.53.02	SR 95	110.00	131.00	La Paz	Widen roadway to 40' cross section	\$10,500,000
19.61	SR 195				Controlled access facility, 3 interchanges	\$30,000,000
19.61.01	SR 195				Avenue E TI	\$10,000,000
19.61.02	SR 195				Avenue B TI	\$10,000,000
19.61.03	SR 195				County 14 th Street TI	\$10,000,000

Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

7.0 Performance Analysis Results

7.0 Performance Analysis Results

This section shows the results of the performance analysis process. Because MoveAZ did not include an analysis of projects in Maricopa County, the results are presented separately for the rest of the State and Maricopa County. Maricopa County projects were analyzed as part of the Maricopa Association of Governments (MAG) regional transportation plan and are, therefore, not presented with the full set of results.

■ 7.1 MoveAZ Performance Analysis in the Rest of the State

MoveAZ project bundles were evaluated on the seven performance factors described in Chapter 4. Projects were evaluated separately for Pima County and the 13 Other Counties to be consistent with the separate funding streams identified for each region. The results of each of these analyses are organized here by the three funding scenarios described above. Projects from the MAG RTP are shown in the next section.

Constrained Revenue Scenario

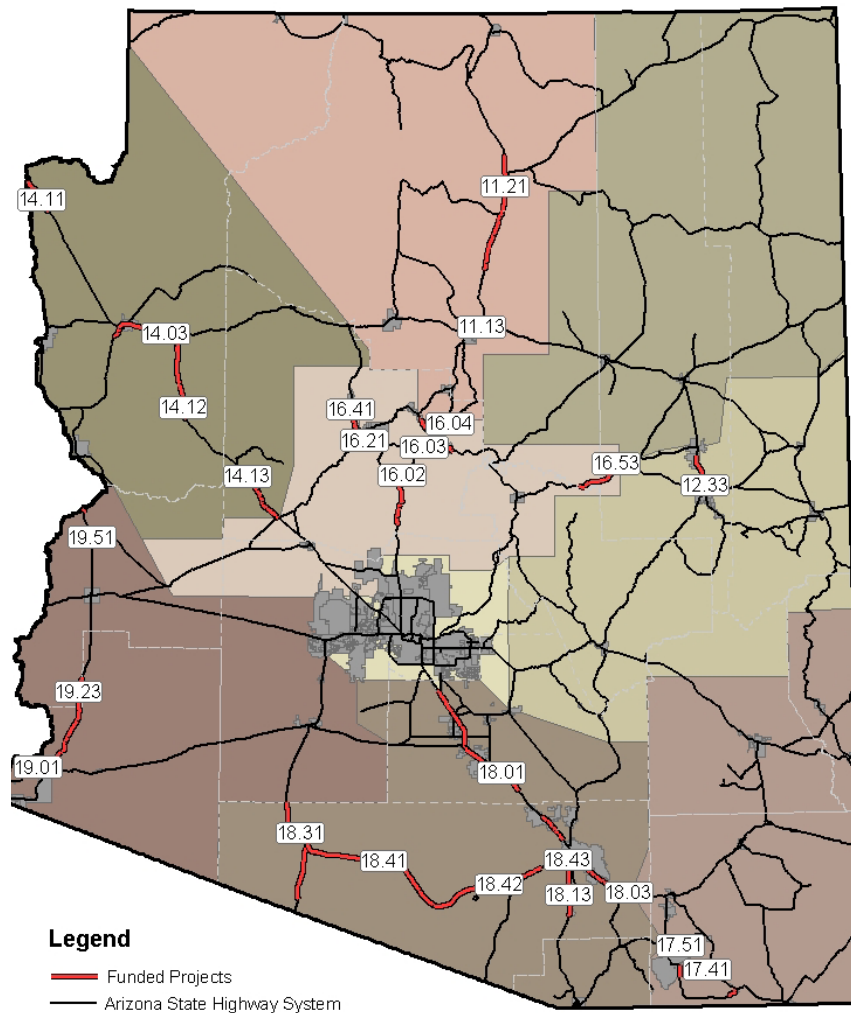
The constrained revenue scenario presents projects that performed the best in the analysis process. Table 7.1 presents the projects in this scenario for the two regions. These projects were analyzed using MoveAZ performance measures and factors. The locations of the constrained scenario projects are shown in Figure 7.1.

Table 7.1 MoveAZ Plan Projects – Constrained Scenario

Project	Road	BMP	EMP	Description	Mobility	Reliability	Safety	Preservation	Resource Conservation	Connectivity	Accessibility	Weighted Score	Cost (Dollars) (in Millions)
Projects in the 13 Other Counties													
16.21	SR 69	281	296	Widen to 6 lanes	9.3	8.1	8.0	0.0	9.6	5.0	0.0	47	49
14.02	I-40	44	45	Widen to 6 lanes, reconstruct or improve 3 interchanges, noise barriers	9.7	9.6	8.6	0.0	1.0	0.0	4.9	42	142
14.11	U.S. 93	2	17	Widen to 4 lanes	5.9	0.0	6.1	0.0	4.0	9.9	4.5	36	47
17.51	SR 92, SR 90	321	325	Widen to 6 lanes, raised median	7.7	1.9	9.6	0.0	8.1	1.4	0.4	36	14
14.12	U.S. 93	92	121	Reconstruct as a 4-lane divided roadway, new interchanges	2.8	0.0	7.1	2.8	0.0	6.8	9.8	36	250
19.23	U.S. 95	31	70	Widen to 4 lanes, replace bridge	3.7	0.0	7.8	0.0	0.0	7.7	8.9	35	117
14.13	U.S. 93	161	182	Reconstruct as a 4-lane divided roadway	5.1	0.0	6.7	0.0	0.0	7.9	6.9	33	85
14.03	I-40	55	71	Widen to 6 lanes, reconstruct two interchanges	7.8	6.3	0.0	10.0	0.0	0.0	1.9	32	107
16.51	SR 260	208	228	Widen to 4 lanes, raised median (14 miles), reconstruct (6 miles)	7.3	0.0	7.4	0.0	0.0	4.2	5.2	31	122
16.41	SR 89	314	330	Widen to 4 lanes, some segments with turn lanes	6.0	0.0	8.7	0.0	1.9	3.6	4.0	31	44
17.52	SR 92	352	354	Widen to 4 lanes, some segments with turn lanes	6.6	0.0	9.9	0.0	7.2	0.0	0.2	30	6
11.13	I-40	195	205	Reconstruct roadway, widen some segments to 6 lane, noise barriers	7.5	4.4	1.7	9.4	1.0	0.0	0.0	30	41
16.04	I-17	286	298	Widen to 6 lanes	9.3	8.5	4.7	0.0	0.0	0.0	0.0	28	82
18.01	I-10	175	226	Widen to 6 lanes	9.7	9.3	3.5	0.0	0.0	0.0	0.0	28	163
16.03	I-17	278	286	Widen to 8 lanes	9.0	7.8	4.1	0.0	0.0	0.0	0.0	26	80
17.41	SR 90	322	336	Widen to 4 lanes, some segments with turn lanes	5.8	0.0	2.3	0.0	0.0	9.0	4.6	26	45

Table 7.1 MoveAZ Plan Projects – Constrained Scenario (continued)

Project	Road	BMP	EMP	Description	Mobility	Reliability	Safety	Preservation	Resource Conservation	Connectivity	Accessibility	Weighted Score	Cost (Dollars) (in Millions)
Projects in the 13 Other Counties (continued)													
12.33	SR 77	342	358	Widen to 4 lanes, implement Rural ITS system	1.6	0.0	7.0	0.0	1.7	7.4	3.8	26	51
19.51	SR 95	131	147	Construct passing lane segments, widen a one-mile segment to 6 lanes	2.8	0.0	7.6	0.0	0.4	5.6	3.9	25	7
16.53	SR 260	282	302	Reconstruct roadway, widen a 5-mile segment to 4 lanes	1.2	0.0	3.9	1.1	0.0	6.3	8.6	25	104
16.02	I-17	244	262	Widen to 6 lanes, implement ITS system	8.6	6.7	0.0	0.0	0.0	0.0	2.7	22	61
11.21	U.S. 89	442	482	Widen to 4 lanes, raised median, 3 new interchanges, some segments with turn lanes	1.2	0.0	4.5	0.0	0.0	5.3	6.7	21	130
19.01	I-8	2	12	Widen to 6 lanes, reconstruct interchanges and bridges	8.0	5.6	2.9	0.0	0.0	0.0	0.0	21	55
Projects in Pima County													
18.02	I-10	240	252	Widen to 8 lanes, construct 3 new interchanges	10.0	10.0	2.9	0.0	9.4	0.0	0.0	38	159
18.04	I-10	262	275	Widen to 6 lanes	9.0	8.9	1.5	0.0	0.0	0.0	0.0	24	43
18.43	SR 86	150	171	Widen to 4 lanes (10 miles) and 6 lanes (11 miles)	6.0	3.7	0.9	0.0	5.7	2.2	0.1	21	22
18.13	I-19	63	91	Widen to 6 lanes (16 miles) and add auxiliary lanes (12 miles)	8.6	7.4	0.0	0.0	0.0	0.0	0.0	19	300
18.03	I-10	275	288	Widen to 6 lanes, reconstruct bridge	8.3	7.0	0.0	0.0	0.0	0.0	0.0	19	36
17.01	I-10	288	303	Widen to 6 lanes	8.4	5.2	0.0	0.0	0.0	0.0	0.7	18	23
18.42	SR 86	92	141	Reconstruct roadway to standards	0.0	0.0	0.0	4.4	0.0	0.0	9.3	16	61
18.41	SR 86	52	92	Reconstruct roadway to standards	0.0	0.0	0.0	3.3	0.0	0.0	8.8	15	122
18.31	SR 85	32	80	Reconstruct roadway to standards	0.0	0.0	0.0	0.0	0.0	0.0	9.9	12	86

Figure 7.1 Map of Constrained Scenario Projects

Additionally Expected Revenues

The second scenario examines the additional projects that might be built if ADOT were to identify new state or Federal funding sources. This scenario was estimated at roughly \$2 billion in additional funding. This funding was split between major projects and sub-programs, as described in Section 2.3. Table 7.2 shows the additional funding that would be available to each region in this scenario.

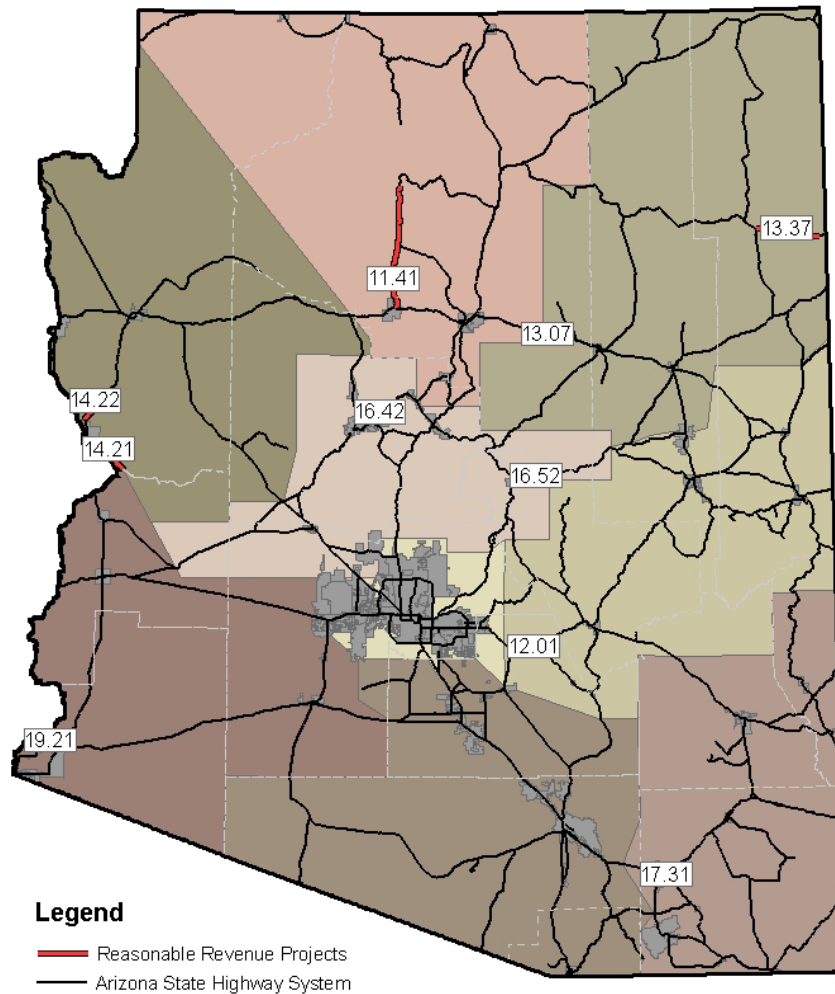
The additional projects funded in this scenario are shown in Table 7.3. The locations of the constrained scenario projects are shown in Figure 7.2.

Table 7.2 Total Funding for Major Projects and Sub-Programs by Region, 2010 to 2025 (Additional Revenue Scenario)

County	Funding for Major Projects (\$M)	Funding for Sub-Programs (\$M)	Total (\$M)
Maricopa	626	108	734
Pima	192	65	258
The 13 Other Counties	387	605	992

Table 7.3 MoveAZ Plan Projects – Additional Revenue Scenario

Project	Road	BMP	EMP	Description	Mobility	Reliability	Safety	Preservation	Resource Conservation	Connectivity	Accessibility	Weighted Score	Cost (Dollars in Millions)
Projects in the 13 Other Counties													
16.42	SR 89A	320	329	Widen to 4 lanes	3.7	0.0	6.3	0.0	0.0	0.0	5.1	20	29
13.07	I-40	230	233	Reconstruct, widen to 6 lanes, reconstruct 3 interchanges	3.7	2.2	0.0	8.9	0.0	0.0	1.3	20	52
13.37	SR 264	446	473	Widen to 4 lanes, raised median, some segments with turn lanes, replace bridge, construct bus turnout	2.3	0.0	0.0	0.0	0.0	4.0	10.0	19	52
16.52	SR 260	256	282	Widen to 4 lanes	1.0	0.0	0.0	0.0	0.0	6.8	8.2	18	15
17.01	I-10	288	303	Widen to 6 lanes	8.4	5.2	0.0	0.0	0.0	0.0	0.7	18	23
12.01	U.S. 60	212	226	Widen to 5 lanes (2 miles), construct new bypass (2 miles), construct 2 interchanges	3.1	0.0	0.0	0.0	0.0	8.7	3.6	17	51
17.31	SR 80	294	299	Add turning lanes, widen some segments to 4 lanes, reconstruct SR 80/I-10 interchange	5.1	0.0	0.0	0.0	0.0	7.6	1.8	17	38
14.22	SR 95	175	202	Widen to 4 lanes at selected locations (14 miles total)	1.8	0.0	2.0	0.0	0.0	5.1	5.0	16	42
19.21	U.S. 95	26	31	Widen to 6 lanes	2.5	0.0	6.2	0.0	0.0	1.0	2.6	16	19
11.41	SR 64	185	235	Add paved shoulders, widen some segments to 4 lanes (5 miles) and add turn lanes (1 mile), construct several passing lanes	2.7	0.0	0.0	0.0	0.0	2.9	7.0	15	47
14.21	SR 95	163	172	Construct passing/climbing lanes, new signage	1.2	0.0	0.0	0.0	0.0	6.0	5.6	14	2

Figure 7.2 Map of Additional Revenue Projects

Unconstrained Scenario

The MoveAZ performance analysis process is based on an assessment of a large number of projects intended to address transportation needs across the State. Because funding is limited, not all of these projects can realistically be constructed in the timeframe of a long-range plan. The unconstrained scenario is designed to identify projects that did not perform, as well as other major projects, but was identified through previous needs assessments conducted by ADOT. Table 7.4 presents the projects in the unconstrained scenario.

Table 7.4 MoveAZ Plan Projects (Unconstrained)

Project	Road	BMP	EMP	Description	Mobility	Reliability	Safety	Preservation	Resource Conservation	Connectivity	Accessibility	Weighted Score	Cost (Dollars in Millions)
Projects in the 13 Other Counties													
19.31	SR 72	13	49	Add paved shoulders, improve vertical/horizontal curves on some segments	0.0	0.0	1.4	0.0	0.0	0.0	10.0	14	59
13.35	SR 264	411	439	Construct climbing lane segments, add passing lanes (1 mile), improve intersection, construct bus turnout	0.4	0.0	0.0	0.0	0.0	0.9	10.0	13	27
11.02	I-17	333	340	Widen to 6 lanes, reconstruct interchange	4.8	4.1	1.8	0.0	0.0	0.0	0.0	13	35
11.24	U.S. 89A	579	613	Construct passing lane segments, widen some segments to 4 lanes (3 miles), construct bus turnout	0.0	0.0	0.0	0.0	0.0	1.2	10.0	13	14
17.22	U.S. 191	111	121	Widen to 5 lanes	1.4	0.0	2.7	2.2	0.0	1.8	2.4	13	34
18.51	SR 87	134	141	Widen to 4 lanes, reconstruct interchange	1.0	0.0	0.0	0.0	2.6	1.6	6.0	13	38
13.24	U.S. 191	420	446	Reconstruct roadway, add shoulders (14 miles), and widen some segments to 4 lanes (5.5 miles)	0.2	0.0	1.5	0.0	0.0	0.5	8.1	13	62
13.41	SR 77	362	387	Construct climbing lanes, rehabilitate 4 bridges	0.5	0.0	0.0	0.0	0.0	4.3	6.2	12	14
19.53	SR 95	110	131	Reconstruct roadway to standards	0.0	0.0	1.4	0.0	0.0	0.0	8.3	12	11
13.03	I-40	282	289	Widen some segments to 6 lanes, construct noise barriers	4.9	3.0	0.0	0.0	1.0	0.0	0.8	12	19
19.61	SR 195			Construct 3 interchanges to make SR 195 a controlled access facility	3.2	0.0	3.9	0.0	0.0	0.0	1.5	12	30
13.36	SR 264	441	446	Widen to 4 lanes, raised median (3 miles), turn lanes (3 miles), construct bus turnout	1.3	0.0	0.0	0.0	0.0	2.1	6.7	12	16
13.25	U.S. 191	446	510	Add paved shoulders, widen some segments to 4 lanes (14 miles) with turn lanes in several locations (2 miles)	0.5	0.0	0.0	0.0	0.0	0.0	9.4	12	94
12.04	U.S. 60	336	402	Add paved shoulders, widen some segments to 4 lanes, with some turning lanes	0.4	0.0	0.0	0.0	0.0	0.7	8.7	12	49

Table 7.4 MoveAZ Plan Projects (Unconstrained) (continued)

Project	Road	BMP	EMP	Description	Mobility	Reliability	Safety	Preservation	Resource Conservation	Connectivity	Accessibility	Weighted Score	Cost (Dollars in Millions)
Projects in the 13 Other Counties (continued)													
14.04	I-40	71	89	Reconstruct roadway (8 miles), add climbing lanes on some segments	5.8	3.3	0.0	0.0	0.0	0.0	0.0	11	34
12.31	SR 77	153	171	Improve shoulders and construct climbing lane segments	0.0	0.0	0.0	0.0	0.0	2.2	7.6	11	11
13.32	SR 264	340	388	Add paved shoulders, construct climbing lanes (6 miles), turn lanes (2 miles), improve curves at 14 locations, and 4 intersections	0.0	0.0	0.0	0.0	0.0	0.0	9.5	11	51
11.01	I-17	298	322	Construct climbing lanes on some segments, reconstruct interchanges and bridges	3.8	5.9	0.0	0.0	0.0	0.0	0.0	11	110
12.43	SR 260	331	338	Widen to 5-lane cross-section	0.9	0.0	1.1	0.0	0.0	4.7	3.1	11	12
13.34	SR 264	386	411	Add paved shoulders, construct climbing lane segments, widen some segments to 4 lanes (5 miles), add turning lanes (6.5 miles), construct bus turnout	0.2	0.0	0.0	0.0	0.0	0.4	8.7	11	32
11.23	U.S. 89	531	556	Improve shoulders, construct passing lane segments (2 miles) and 4 lane segments (2 miles)	0.9	0.0	0.1	0.0	0.0	2.6	5.8	11	18
14.05	I-40	91	120	Reconstruct roadway, widen some segments to 6 lanes (18 miles), reconstruct two interchanges	4.7	2.6	0.0	0.0	0.0	0.0	1.4	11	111
17.23	U.S. 191	130	144	Construct climbing lane segments, construct bypass (5 miles)	2.2	0.0	0.0	0.0	0.0	3.1	3.7	11	22
13.04	I-40	292	311	Reconstruct roadway	0.0	0.0	0.0	8.3	0.0	0.0	0.0	10	75
17.12	U.S. 70	335	349	Widen to 4 lanes, raised median, some segments with turn lanes	2.5	0.0	0.0	0.0	0.0	2.8	2.9	10	19
13.21	U.S. 191	344	365	Reconstruct roadway, add passing lane	0.0	0.0	0.0	1.7	0.0	0.0	6.5	10	52
11.32	U.S. 160	321	323	Widen to 5 lanes, add paved shoulders (1 mile)	1.0	0.0	0.0	0.0	0.0	1.1	6.1	10	27
12.61	SR 79	132	150	Widen to 4 lanes	0.5	0.4	0.4	0.0	0.0	2.3	4.8	10	60

Table 7.4 MoveAZ Plan Projects (Unconstrained) (continued)

Project	Road	BMP	EMP	Description	Mobility	Reliability	Safety	Preservation	Resource Conservation	Connectivity	Accessibility	Weighted Score	Cost (Dollars in Millions)
Projects in the 13 Other Counties (continued)													
12.11	U.S. 70	253	287	Add shoulders, widen some segments to 4 lanes with occasional turning lanes, lengthen passing lane (0.5 miles)	0.0	0.0	2.5	0.0	0.0	0.9	4.2	9	66
11.51	SR 264	322	340	Add paved shoulders, widen some segments to 5 lanes (1 mile), construct climbing lane segments and bus turnout	0.0	0.0	0.0	0.0	0.0	0.0	7.8	9	18
13.05	I-40	311	339	Reconstruct roadway and one interchange	0.0	0.0	0.0	7.8	0.0	0.0	0.0	9	127
13.23	U.S. 191	379	412	Reconstruct roadway, add passing lane (1 mile)	0.1	0.0	0.0	0.0	0.0	0.0	7.1	9	133
13.06	I-40	339	360	Reconstruct roadway, reconstruct 2 interchanges	0.0	0.0	0.0	7.2	0.0	0.0	0.0	9	113
18.22	SR 77	92	95	Construct climbing/passing lanes at selected locations	1.4	0.0	0.0	0.0	0.0	6.6	0.0	9	1
11.31	U.S. 160	336	343	Construct passing and climbing lanes	0.7	0.0	0.0	0.0	0.0	1.0	5.5	8	2
17.24	U.S. 191	154	165	Widen shoulders, raise bridge	0.0	0.0	3.3	0.0	0.0	0.0	3.2	8	25
17.25	U.S. 191	23	27	Reconstruct roadway, widen to 4 lanes	0.0	0.0	0.0	5.6	0.0	0.1	1.1	8	14
11.11	I-40	155	165	Reconstruct segments (2 miles)	0.0	0.0	0.0	6.7	0.0	0.0	0.0	8	14
17.61	SR 266	104	123	Widen shoulders	0.0	0.0	0.0	0.0	0.0	0.0	6.4	8	5
12.21	SR 73	310	335	Widen shoulders	0.0	0.0	0.0	0.0	0.0	0.0	6.3	8	13
14.01	I-40	37	44	Reconstruct and widen to 6 lanes, reconstruct two interchanges	0.0	1.5	0.0	5.0	0.0	0.0	0.0	7	63
14.06	I-40	123	144	Reconstruct roadway	0.0	0.0	0.0	6.1	0.0	0.0	0.0	7	86
13.11	U.S. 160	361	384	Add passing lanes at selected locations	0.3	0.0	0.0	0.0	0.0	1.5	4.3	7	7
18.61	SR 287	134	142	Widen to 4 lanes, construct 2 new interchanges	0.3	0.0	0.0	0.0	0.0	2.4	3.3	7	56
12.06	U.S. 60	252	337	Construct selected passing and climbing lane segments	0.0	0.0	0.0	0.0	0.0	3.0	3.0	7	28
11.22	U.S. 89	498	504	Construct passing lanes	0.8	0.0	0.0	0.0	0.0	2.6	2.1	6	2

Table 7.4 MoveAZ Plan Projects (Unconstrained) (continued)

Project	Road	BMP	EMP	Description	Mobility	Reliability	Safety	Preservation	Resource Conservation	Connectivity	Accessibility	Weighted Score	Cost (Dollars in Millions)
Projects in the 13 Other Counties (continued)													
13.22	U.S. 191	370	379	Reconstruct roadway	0.0	0.0	0.0	0.6	0.0	0.0	3.5	5	24
17.26	U.S. 191	45	65	Reconstruct roadway	0.0	0.0	0.0	3.9	0.0	0.0	0.0	5	77
12.03	U.S. 60	260	273	Construct selected passing and climbing lane segments	0.0	0.0	0.0	0.0	0.0	1.6	1.2	3	2
12.51	SR 277	331	336	Widen to 5 lanes	0.0	0.0	0.0	0.0	0.0	0.0	2.3	3	26
11.16	I-40	226	233	Reconstruct roadway, add some climbing lane segments, reconstruct traffic interchange	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2	25
17.02	I-10	310	325	Construct selected climbing lane segments	1.6	0.0	0.0	0.0	0.0	0.0	0.0	2	21
17.11	U.S. 70	287	329	Repair shoulder segments, move headwalls	0.0	0.0	0.0	0.0	0.0	0.0	1.7	2	11
19.02	I-8	17	20	Add paved shoulders	0.0	0.0	1.4	0.0	0.0	0.0	0.0	2	2
19.52	SR 95	147	161	Add turn lane, new signage	0.0	0.0	1.4	0.0	0.0	0.0	0.0	2	32
12.42	SR 260	317	335	Construct selected passing/climbing lane segments, add paved shoulders	0.0	0.0	0.0	0.0	0.0	0.3	1.0	1	3
17.21	U.S. 191	87	104	Widen shoulders	0.0	0.0	0.5	0.0	0.0	0.0	0.0	1	9
11.12	I-40	167	196	Construct climbing lane (1 mile), reconstruct 4 interchanges, widen 2 bridges, construct noise barriers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	84
17.71	SR 366	136	143	Reconstruct as a paved roadway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	15

■ 7.2 Maricopa County

In Maricopa County, the Maricopa Association of Governments (MAG) Regional Transportation Plan (RTP) was adopted by the State Transportation Board as the state plan for this area. As described previously, 37 percent of total state and Federal funding programmed by ADOT will be available to the MAG region. Table 7.5 identifies the projects that would be funded from both ADOT and local sources.

Table 7.5 MoveAZ Plan Projects – Constrained Scenario

Project	Road	BMP	EMP	Description	Score	Cost (\$M)
Projects in Maricopa County						
15.01	I-10	113	125	Widen to 6 lanes, new interchange	–	\$115
15.02	I-10	125	134	Widen to 8 lanes with HOV, 2 new interchanges	–	\$178
15.03	I-10	134	143	Widen to 10 lanes	–	\$79
15.04	I-10	147	156	Collector/distributor roadway system	–	\$500
15.05	I-10	156	168	Widen to 8 lanes, extend HOV, new interchange	–	\$113
15.03	I-10R			Construct new 2 and 6-lane road (I-10 Reliever)	–	\$805
15.11	I-17	194	201	Add HOV lanes in each direction	–	\$77
15.12	I-17	202	209	Widen to 12 lanes (some 14 lane segments)	–	\$1,000
15.13	I-17	209	224	Widen to 10 lanes, extend HOV, new interchanges		\$268
15.14	I-17	224	229	Widen to 8 lanes with HOV		\$72
15.15	I-17	229	232	Widen to 6 lanes		\$26
15.21	SR 101	2	23	Widen to 10 lanes with HOV, 2 new interchanges	–	\$334
15.22	SR 101	23	51	Widen to 10 lanes with HOV, new interchange		\$387
15.23	SR 101	51	61	Widen to 10 lanes with HOV		\$104
15.31	SR 202	0	21	Widen to 10 lanes with HOV, some segments Eastbound lanes only	–	\$258
15.32	SR 202	54	76	Construct new 6 lane freeway	–	\$1,067
15.41	SR 303	0	36	Construct new 6 lane freeway	–	\$1,420
15.51	SR 51	10	16	Widen to 10 lanes	–	\$51
15.61	SR 85	117	154	Widen to 4 lane divided highway	–	\$90
15.71	U.S. 60	139	163	Widen to 6 lanes with grade separation	–	\$250
15.72	U.S. 60	171	194	Widen to 8, 10, and 12 lanes, extend HOV	–	\$147
15.81	WG FWY			Construct 6 lane Williams Gateway freeway	–	\$325